

FIVE-YEAR REVIEW
UMETCO MINERALS CORPORATION
URAVAN SUPERFUND SITE
URAVAN, COLORADO



Prepared for:

U.S. Environmental Protection Agency, Region VIII
999 18th Street
Denver, Colorado 80202

Prepared by:

Frontier Environmental Services, Inc.
5171 Ward Road, Unit 1
Wheat Ridge, Colorado 80033

Approved By: _____

Max Dodson
Max Dodson
Assistant Regional Administrator
U.S. EPA, Region 8

Date: _____

9/28/05

TABLE OF CONTENTS

| <u>Section:</u> | <u>Page Number:</u> |
|---|----------------------------|
| Executive Summary | ES-1 |
| 1.0 INTRODUCTION | 1-1 |
| 2.0 SITE BACKGROUND | 2-1 |
| 3.0 REGULATORY COMPLIANCE | 3-1 |
| 3.1 Statutory Review | 3-1 |
| 3.2 ARARs | 3-1 to 3-3 |
| 4.0 DESCRIPTION OF REMEDIAL ACTION OBJECTIVES | 4-1 |
| 4.1 Atkinson Creek Crystal Disposal Area | 4-1 |
| 4.2 Club Ranch Ponds Area | 4-3 |
| 4.3 River Ponds Area | 4-9 |
| 4.4 Club Mesa Tailings Piles | 4-11 |
| 4.5 Club Mesa Area | 4-17 |
| 4.6 Uravan Mill Areas | 4-19 |
| 4.7 Town and Adjacent Areas | 4-23 |
| 4.8 Burbank Quarry | 4-27 |
| 4.9 Borrow Areas on Club Mesa | 4-30 |
| 4.10 Hillside Seepage and Tailings Liquids | 4-32 |
| 4.11 Pond Liquids | 4-34 |
| 4.12 Storm Water Surface Runoff | 4-35 |
| 4.13 Ground Water | 4-36 |
| 5.0 MISC. REMEDIAL ACTION PLAN REQUIREMENTS | 5-1 |
| 5.1 Requirements | 5-1 |

| | | |
|-------|--|-----|
| 5.2 | Environmental Review..... | 5-1 |
| 5.2.1 | Meteorology..... | 5-1 |
| 5.2.2 | Ambient Air Quality | 5-2 |
| 5.2.3 | External Gamma | 5-2 |
| 5.2.4 | San Miguel River Sediment, Soil, Vegetation & Grazing Uptake | 5-2 |
| 5.2.5 | Tailings Pile Number 2 and Number 3; and Burbank Repository..... | 5-2 |
| 5.2.6 | Rim Erosion | 5-2 |
| 5.2.7 | Liquid Waste Management | 5-3 |
| 5.2.8 | Surface Water..... | 5-3 |
| 5.2.9 | Ground Water..... | 5-4 |
| 5.3 | Occupational Health and Safety..... | 5-4 |
| 5.4 | Quality Assurance and Quality Control..... | 5-5 |
| 5.5 | Community Relations | 5-6 |
| 5.6 | Compliance | 5-8 |
| 6.0 | RECOMMENDATIONS..... | 6-1 |

DRAWING:

Drawing Number 1: Uravan Uranium Site Map with Remedial Action Plan Boundary

FIGURES:

| | |
|------------|---|
| Figure 1A: | Uravan Site RAP Area and Orthographic Overlay |
| Figure 1B: | Uravan Site RAP Area Topographic Map |
| Figure 2: | Atkinson Creek Disposal Area |
| Figure 3: | Club Mesa and Borrow Areas |
| Figure 4: | Club Mesa Tailings Piles and Seepage Collection Sumps |
| Figure 5: | Club Ranch Evaporation Ponds |
| Figure 6: | Club Ranch Evaporation Pond Number 4 |
| Figure 7: | Historical Buildings and River Ponds Areas |
| Figure 8: | Mill Site, Mill Hillside and Plant A Areas |
| Figure 9: | Plant B and Bone Yard Areas |
| Figure 10: | Burbank Quarry - Title 1 and DOE - Title 2 Repositories |

EXECUTIVE SUMMARY

Frontier Environmental Services, Inc. was tasked by the United States Environmental Protection Agency (EPA) Region VIII to conduct a Five-Year Review of the Umetco Minerals Corporation Uravan Superfund Site to evaluate whether the remedial actions taken at the site to date remain protective of human health and the environment. The purpose of this review is to confirm that selected remedies remain effective. This is accomplished through a site visit, a review of the administrative records, and review of applicable or relevant and appropriate requirements (ARARs).

The Uravan Site was contaminated by radioactive residues resulting from the processing of vanadium- and uranium-containing ores from the early 1900's through the mid-1980's. In December 1983, the State of Colorado filed a natural resources damages claim against Union Carbide and Carbon Corporation and Umetco under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). The site was proposed to the National Priorities List (NPL) in 1984 and was finalized to the NPL in 1986. In 1985, Umetco and the State of Colorado began discussions concerning remedial action and cleanup of the site. The result of these discussions was the preparation of a Consent Decree and Remedial Action Plan (RAP) in 1986 that outlined the requirements for Umetco to remediate the site. This document is the functional equivalent of the U.S. Environmental Protection Agency Remedial Investigation/Feasibility Study and Record of Decision. The United States District Court for the State of Colorado approved the consent Decree and RAP on February 12, 1987.

Solid wastes at the Uravan site are milling and cleanup residues that include: mill tailings; evaporation crystals and sludges; milling refuse; and mill debris. These wastes total over 10,000,000 cubic yards and contain radioactive elements, metals and inorganic compounds. Liquid wastes from seepage collection and ground water extraction systems total over 350 million gallons through FY2004. These liquids also contain radioactive elements, metals and inorganic compounds.

Objectives of the ongoing and completed remedial activities are to:

- Protect surface and ground water resources;
- Stabilize and control the tailings and other solid waste materials;
- Minimize radon emissions from the tailings and waste repositories; and
- Conduct soil cleanup in a safe and environmentally sound manner.

Remedial actions conducted and completed to date include:

- Removal and cleanup of dispersed materials and contaminated soils from approximately 401 acres;
- Relocating more than 3 million cubic yards of mill wastes and contaminated materials to secure repositories on Club Mesa.

- Constructing waste and tailing repository covers, liquid evaporation and retention ponds, and permanent runoff control structures - utilizing more than 1.7 million cubic yards of earthen materials;
- Construction of five (5) double-lined ponds (totaling 40-acres) for the evaporation of hillside seepage, tailings pile seepage and extracted ground water;
- Construction and utilization of a new repository in the B-Plant area capable of disposing in excess of 1.8 million cubic yards of evaporative pond demolition debris and radioactive waste;
- Demolition and removal of about 50 major mill facility structures and buildings, including the process systems and circuits, and removal of over 260 buildings in the town of Uravan;
- Collection and control of over 70 million gallons of hillside and tailings seepage, containing approximately 6,000 tons of contaminated inorganic compounds. Hillside and tailings seepage that was collected was transferred to Club Ranch Ponds for management by evaporation;
- Extraction of approximately 245 million gallons of contaminated liquids from the ground water remedial program with the removal of approximately 14,500 tons of contaminated inorganic compounds. Contaminated ground water that was collected was transferred to Club Ranch Ponds for management by evaporation, and;
- Removal of contaminated materials from the Old and New Town Dumps with placement into the Club Mesa Tailing repository.

Umetco and the State of Colorado Department of Public Health and Environment (CDPHE) Radiation Control Division review of environmental monitoring data has indicated that ambient air particulate concentration of radionuclides (including uranium, thorium and radium) has decreased since the last five-year review (2000).

Surface water quality monitoring measurements indicate that there have been no apparent adverse impacts from radionuclides, metals, or inorganic compounds to the San Miguel River at Uravan since the last five year review. Concentrations of constituents in the San Miguel River during high and low flow conditions demonstrate that currently there is no demonstrated risk to human health or the environment from hazardous materials located and managed at the Uravan site.

Concentrations of total dissolved solids in the Kayenta formation beneath Club Ranch Evaporation Ponds have decreased an average of 80% in the higher permeability zones and 51% in lower permeability zones in the last thirteen years of ground water extraction. Present concentrations of total dissolved solids in ground water recovered from the Kayenta formation demonstrate a state of equilibrium and have essentially reached a steady-state condition.

Current occupational doses to ionizing radiation are below site established limits. Over the past five years occupational and public radiation monitoring indicated that exposures

are well below allowable rates as set by the Nuclear Regulatory Commission (NRC) and the CDPHE regulations for permissible exposure to radiation.

Environmental conditions identified during this Five-Year Review that remain to be addressed or completed include:

1. Providing definitive time-line schedule for the implementation and completion of RAP construction/closure activities, i.e.;
 - Club Ranch Ponds
 - Club Mesa Tailings Piles
 - B-Plant Area Repository
 - Mill Hillside and Mill Areas
 - Hillside Seepage Management
 - Surface water run-off control features
 - Ground water monitoring and mitigation
2. Providing continued systematic management of collected site liquids from hillside seepage collection system(s) and storm water runoff from active repository units;
3. Providing an updated maintenance and repair program for constructed storm water management systems;
4. Continuing to provide inspection, repair and maintenance of in-service Club Ranch Ponds, and implementing a systematic closure of the Club Ranch Ponds that are deemed non-serviceable and/or are no longer required as liquid management systems supporting other on site RAP activities;
5. Developing a “Windblown Area” assessment, evaluation and report using as a minimum “area-averaging methods” as prescribed by the CDPHE – Radiation Management Program guidance;
6. Finalizing the determination of the disposition and action on disposal of PCB containers stored within the RAP boundaries;
7. Resolving issues with the Colorado Department of Transportation for the management of radioactive waste materials remaining beneath Colorado Highway 141 and implementing response in accordance with the RAP;
8. Finalizing the Institutional Control Agreement and its implementation by Montrose County Board of County Commissioners for Montrose County Roads Y-11 and E-22.

In summary, remedial activities at the Umetco Minerals Corporation Uravan Remedial Action Project are being conducted in accordance with the Consent Decree and the Remedial Action Plan and are scheduled for completion by the end of December 2007. Monitoring data indicate that air and ground water resources have improved, that there is no apparent impact from the site on surface water, and that occupational and public exposures are below the prescribed regulatory limits. Based on available information, it appears that the selected remedies remain effective in protecting the environment and the health of the public.

1.0 INTRODUCTION

Frontier Environmental Services, Inc. was tasked by the United States Environmental Protection Agency (EPA) Region VIII to conduct a Five-Year Review of the Umetco Minerals Corporation Uravan Superfund Site to evaluate whether the response actions taken at the site to-date remain protective of human health and the environment.

This Five-Year Review was conducted according to procedures outlined in the Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-03B-P, June 2001; Comprehensive Five-Year Review Guidance; and is consistent with the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the National Contingency Plan (NCP). Specifically, the Five-Year Review included an evaluation of documents and standards, an assessment of site conditions, and preparation of this Five-Year Review Report. This report includes a description of site background (Section 2.0); a review of site Applicable or Relevant and Appropriate Requirements (ARARs) (Section 3.0); a discussion of remedial objectives and status of the remedial actions (Section 4.0); Miscellaneous Remedial Action Plan Requirements, including an evaluation of environmental and health conditions at the Uravan site (Section 5.0); and a presentation of recommendations and a discussion of actions taken by Umetco Minerals Corporation on EPA recommendations presented in the 1999/2000 Five-Year Review Report (Section 6).

This review is conducted no less often than every five years following commencement of the remedial program. Five-Year reviews were conducted by EPA in 1999/2000. This report fulfills the 2005 statutory reporting requirement.

2.0 SITE BACKGROUND

The Uravan Site is located in the western portion of Montrose County, Colorado on Colorado Highway 141 approximately 13-miles northwest of the Town of Nucla, Colorado; 81-miles south of the Town of Whitewater, Colorado in Mesa County; and 50 air miles southwest of the City of Grand Junction, Colorado. The site habitat is characterized by an arid climate, sparse vegetation, and rugged topography. Topographic features in the site are dominated by broad mesas and incised canyons. The Uravan site is within the incised San Miguel River Valley and on top of a part of the adjacent Club Mesa as shown in the below photograph taken in May 2005.



Mining operations in this area of Colorado began in the early 1900's. Mining of radium-bearing carnotite ore ($K_2(UO_2)(V)_4$) began in approximately 1910 when Standard Chemical Company first acquired mining claims in the area. The Standard Chemical Company built a radium mill known as the Joe Junior Mill in 1914. The mill was located on the valley floor along the San Miguel River at the site of what later became known as "A-Plant". The mill produced radium until 1919.

In 1928 Union Carbide Corporation (UCC) purchased the Standard Chemical Company holdings in Colorado through their subsidiary U.S. Vanadium Corporation (USV). The Standard Chemical Corporation reserves were reportedly purchased for the recovery of vanadium. USV expanded the "A-Plant" in 1934, constructing a mill and roasting plant to recover vanadium from carnotite ore; and added uranium recovery circuits shortly thereafter with operations starting in 1937 and 1938 at the Uravan site. The town of Uravan was established in 1935 to house workers and their families at the mill and mine facilities.

During the two-year period of 1937 through 1938, approximately 250,000 pounds of triuranium octoxide U_3O_8 was produced. The material was refined in Uravan and the recovered vanadium and uranium concentrates were sold to the U.S. Army.

In the fall of 1942, the Manhattan Project and USV officials discussed building new facilities for the U.S. Government to process uranium. Construction began in 1943 for a new plant at Uravan (termed the WSP Plant) near the existing USV mill (termed the WAA Plant). USV's WAA Plant was put under government contract by June 1944. The government's WSP Plant at Uravan was operational in July 1943 and discontinued operations in 1945; and was subsequently dismantled. In 1945, USV's WAA mill reverted to private operations.

The mill circuits were continually improved to meet product demand and the "B-Plant" was constructed in 1955. The B-Plant was located on a bench on Club Mesa several hundred feet above the San Miguel River. Uranium and vanadium were recovered from leach liquors with a column ion-exchange process, followed by precipitation and drying of the uranium containing "yellow-cake". Tailings from "B-Plant" were placed in piles on a bench of Club Mesa. A radium removal circuit was installed in 1958 to treat waste solutions. Three unlined Club Ranch Ponds were constructed between 1963 and 1965 to aid liquid management through a combination of evaporation and seepage. Additional liquid management units improvement added later included the addition of a neutralization circuit to permit part of the mill process wastes to be discharged directly to the San Miguel River and the installation of a spray evaporation system in 1976 on Club Mesa. Between 1936 and 1984, when Union Carbide and Carbon Corporation operated the mill complex, approximately 42 million pounds of uranium oxide (U_3O_8) and 222 million pounds of vanadium oxide (V_2O_5) were produced. Umetco Minerals Corporation (Umetco), a subsidiary of Union Carbide (later – a subsidiary of Dow Chemical), has operated the facility since its closure in 1984.

The Uravan mill's capacity continued to expand into the 1950's to meet the demand for uranium required by the United States government's weapons programs, pursuant to a contractual agreement between USV and the United States Atomic Energy Commission (AEC). Uravan received uranium/vanadium ores from over 200 mines in the area. The mill operated under a series of licenses issued by the United States Nuclear Regulatory Commission (NRC) [Subsequently regulated by the Atomic Energy Commission (AEC)] and from the State of Colorado from 1948 to this date. The amended licenses became increasingly complex, addressing worker safety and health concerns, public safety and health, and environmental issues. The Uravan mill was operated under an AEC Source Material License Number SUA-673 until 1968. In 1968, the State of Colorado became an agreement state with the AEC, and as such, took over all licensing functions. After 1968, the Uravan mill operated under a radioactive material license issued by the Colorado Department of Public Health and Environment (CDPHE).

The State of Colorado (State) filed a natural resources damages claim against Union Carbide and Carbon Corporation and Umetco Minerals Corporation in December 1983

under CERCLA. The Uravan site was proposed to the National Priorities List (NPL) on October 15, 1984; 49 Federal Register 40320 (1984). On June 10, 1986, the listing of the site was finalized on the NPL; 49 Federal Register 21054 (1986).

In 1985, the State and Umetco began discussions regarding remedial activities to be conducted at the Uravan site. These discussions resulted in the preparation of a Consent Decree and associated Remedial Action Plan (RAP). The RAP is the functional equivalent of an EPA Remedial Investigation/Feasibility Study (RI/FS) and Record of Decision (ROD). The United States District court for the District of Colorado approved the Consent Decree and RAP on February 12, 1987.

Under the Consent Decree, Umetco is required to complete reclamation activities specified in the RAP. To complete these activities, construction, health and safety and environmental documents were prepared by Umetco. These documents were submitted to the State of Colorado for review and approval. Modification to and approval of these documents are periodically conducted to reflect changing site conditions as remedial activities progress. These documents form the basis for conducting, monitoring, and assessing the remedial activities and determining if the selected remedy is protective of human health and the environment. These governing site-specific documents include:

- 1995 Uravan Remedial Action Plan (RAP) Policy and Procedures Manual, as amended, which describes site specific health, safety and environmental policies and procedures to be used at Uravan.
- 1996 Umetco Minerals Corporation Safety Manual, as amended, which sets forth the policies and procedures for conducting the remedial activities in a safe, responsible manner.
- 1987 Quality Plans, as amended, which provide quality assurance and quality control requirements and set forth site specific mechanisms to evaluate the performance of the remedial activities.
- 1987 Final Plan and Specifications, as revised, which present basis and technical data for the remedial activities and provide engineering drawings and specifications for construction work to be conducted during site reclamation.

Under the Consent Decree, Umetco is required to complete the following general remedial activities as specified in the RAP:

- Reshaping the 10 million cubic yard tailings repositories and constructing a long-term containment cover and appropriate drainage controls.
- Relocating 1.5 million cubic yards of mill wastes, including evaporative crystals and wastewater treatment sludges, to a secure on-site repository and constructing long-term containment controls.
- Clean-up dispersed soils.
- Decommissioning and demolition of the milling facilities.
- Remediation of ground water resources.

3.0 REGULATORY COMPLIANCE

Consistent with Section 121 of CERCLA, as amended, and 40 CFR §300.430(f) of the National Contingency Plan (NCP), the EPA is performing this Five-Year Review for the Umetco Minerals Corporation Uravan Superfund Site. EPA determined the level of review based upon site-specific considerations including the nature of the response action, the status of the onsite response activities, proximity to populated areas and sensitive environments, and the interval since the last review was conducted (FY1999/2000). The components of this Five-Year Review include:

- Review of documented operation and maintenance of the Uravan site.
- Performance of a site visit.
- Limited analysis of site conditions.
- Review of the administrative record.
- Review of Federal and State environmental laws cited in the Consent Decree and Remedial Action Plan to determine if they remain applicable, relevant and appropriate requirements (ARARs).

3.1 Statutory Review

A statutory five-year review is required at any site where unlimited use and un-restricted exposure, based on the Consent Decree and RAP cleanup levels, have not been attained. A Five-Year Review is required no less often than every five years after initiation of the selected remedial action. In 1994, EPA issued a 1993 Five-Year Review for the Umetco Minerals Corporation Uravan Superfund Site for the period of 1988 through 1993; issued a 1999/2000 Five-Year Review for the Umetco Minerals Corporation Uravan Superfund Site for the period of 1994 through 1999; and conducted the current review in May 2005. Another Five-Year Review will be conducted in 2010 or earlier unless existing onsite contamination is removed to allow unrestricted access and unlimited use of the property. This document presents the results of the 2005 review.

3.2 ARARs

The Consent Decree for Civil Action Number 83-C-2384 for the State v. UCC and Umetco and the Remedial Action Plan (RAP) were reviewed for this Five-Year Review. Applicable or Relevant and Appropriate Requirements (ARARs) discussed in these documents are presented below:

ARARs for the Uravan site set forth in the Consent Decree Remedial Action Plan (RAP) are consistent with current cleanup standards. No changes to the ARARs requirements for site cleanup have been promulgated; however changes in public and occupational exposure standards are incorporated in the evaluation of remedial activities at the Uravan Site.

3.2.1 Transportation of Radioactive Materials

Colorado Code of Regulations 1007-1 Part 17 pertaining to the transportation of radioactive materials remains unchanged.

3.2.2 Cleanup Criteria for Soils

Code of Federal Regulations 40 CFR §192, Subpart D sets standards for soil cleanup. Soil criteria of 5 $\mu\text{Ci/g}$ Ra^{226} above background in soil as measured 0 to 15-cm below ground surface remains unchanged and is consistent with the current version of the Uravan Remedial Action Plan (RAP) Table 4.1.2-1.

3.2.3 Ground Water Quality Protection Standards

Ground water protection standards outlined in 40 CFR §192.32(a)(2) remain unchanged and consistent with the current version of the Uravan Remedial Action Plan (RAP) Table 5.4.3.2-2.

3.2.4 Public Radionuclide Exposure Standards

Current public ionizing radiation dose standards for the Uravan site are published in the State of Colorado Rules and Regulations Pertaining to Radiation Control, 1990, as amended. Applicable standards are in Part 4, specifically in RH 4.14, 4.15, Appendix A of Part 4, and in Part 18, Criterion 8. Additional public dose limits for airborne radionuclides other than radon and its daughters are published in 10 CFR 20-1101. The public dose limits in Part 4 and 10 CFR 20-1101 are regulatory changes that have occurred following implementation of the Remedial Action Plan (RAP). The public dose limits specified in Part 18, Criterion 8 are identical to 40 CFR 190 and have been applicable to reclamation activities at the Uravan site since RAP implementation.

Regulation RH 4.14 limits the Total Effective Dose Equivalent (TEDE) to individual members of the public from the licensed operation at 100 mrem per year. This regulation also limits the dose in any unrestricted area from external sources to 2 mrem in any hour. These standards became effective January 1, 1994.

Regulation RH 4.15 and Appendix A of Part 4 describe methods to show compliance with dose limits for individual members of the public. This standard became effective January 1, 1994.

The standards in 10 CFR 20-1101 establish a constraint of 10 mrem per TEDE to members of the public from airborne radioactive effluents to the environment from licensees as part of its program to maintain dose As Low As Reasonable Achievable (ALARA). This rule applies to airborne effluent of radioactive materials to the

environment, other than radon and its daughters, from licensees except power reactors. This rule became effective on January 9, 1997.

3.2.5 Occupational Radionuclide Exposure Standards

Current occupational ionizing radiation dose standards for the Uravan site are published in the State of Colorado Rules and Regulations Pertaining to Radiation Control, 1990, as amended. Applicable standards are in Part 4, specifically RH 4.6 and Appendix A. In May 1991, the Nuclear Regulatory Commission published revised 10 CFR Part 20 regulations which were required to become effective in agreement states, like Colorado, by January 1, 1994.

The standards in Part 4.6 of the State of Colorado Rules and Regulations Pertaining to Radiation Control require licensees to control the occupational dose to workers to an annual limit, which is more limiting of:

- The TEDE being equal to 5 rem; or
- The sum of the deep dose equivalent and the committed dose equivalent to any organ or tissue other than the lens of the eye being equal to 50 rem.
- The annual limits to the lens of the eye and extremities are 15 rem and 50 rem respectively.

4.0 DESCRIPTION OF REMEDIAL ACTION AND OBJECTIVES

Solid wastes at Uravan are comprised of milling and cleanup residues that include mill tailings; evaporation crystals and sludges; milling refuse; and mill debris. These wastes total over 10,000,000 cubic yards and contain radioactive elements, metals and inorganic compounds. Liquid wastes from seepage collection and ground water extraction systems total over 350 million gallons at the end of 2004. These liquids also contain radioactive elements, metals and inorganic compounds.

Objectives of the remedial activities are to:

- Protect surface and ground water resources;
- Stabilize and control the tailings and other waste materials;
- Minimize radon emissions from the tailings and waste repositories; and
- Conduct soil cleanup in a safe and environmentally sound manner.

Meeting these objectives assures the protection of human health and environment. The general site remedies chosen to achieve the remedial objectives include:

- Reshaping the tailings repositories and constructing a long term containment cover and appropriate drainage controls;
- Relocating mill wastes, including evaporation pond generated crystals and wastewater treatment sludges, to a secure on-site repository and constructing long-term containment controls;
- Cleanup of dispersed contaminated soils;
- Decommissioning and demolition of milling facilities;
- Remediation of ground water resources by pumping and evaporating contaminated ground water; and
- Performing the remediation in a safe manner that minimizes impact on the environment and to the remediation personnel.

From 1987 through 2004, remedial work included the removal and relocation of the vast majority of contaminants from the San Miguel River Valley and Club Mesa, decommissioning and demolition of the mill facility complex, installation and operation of the ground water withdrawal system and the removal of dispersed contaminated soils and debris from the Uravan site and nearby locations.

4.1 Atkinson Creek Crystal Disposal Area

4.1.1 History

The Atkinson Creek Crystal disposal area was located downstream from the Club Ranch Ponds and adjacent to Atkinson Creek. This disposal area was constructed in the early 1970s on the site of a former mobile home park. The mobile homes were removed and the underlying soils were excavated and stockpiled adjacent to the area. After preparation of the site, approximately 200,000 cubic yards of raffinate crystals from the Club Ranch Ponds #1 and #6 were removed and stored in the Atkinson Creek area. No

liner was placed beneath the crystals to prevent contamination of the underlying soils or ground water. Natural soils were placed on the raffinate crystals to form a soil cover approximately twelve inches thick.

4.1.2 Remedial Objectives

In the Remedial Action Plan, the State of Colorado selected excavation and on-site disposal of the raffinate crystals in the Burbank Quarry, an approved raffinate crystal storage area, and disposal of other contaminated soils in the Tailings Piles on Club Mesa as the remedy for the Atkinson Creek Disposal Area. The objectives of this remedy were to remove the source of potential future ground and surface water contamination by raffinate crystal dissolution or erosion.

4.1.3 Site Status and RAP Requirements

Remedial action at this site was completed as of October 14, 1999. A Final Completion Report has been generated and submitted to the State of Colorado Department of Public Health and Environment (CDPHE). The final completion report has been reviewed and accepted by CDPHE.

4.1.4 Summary of Site Visit Observations and Findings

The on-site visit of May 11, 2005 found Atkinson Creek Disposal Area to be visually restored and well vegetated as compared to the surrounding areas not included in the Atkinson Creek Disposal Area. Crystals, discoloration, or other signs of contamination were not observed in this area. Visible signs of severe erosion were also not observed. Vegetation had re-established itself and visually appeared to be very healthy. The site is equipped with a well maintained fence, which aids in keeping grazing animals off the site.

4.1.5 Photographs

Photographs shown below illustrate the current status of the Atkinson Creek Disposal Area, showing re-establishment of vegetation.



Reclaimed and vegetated Atkinson Creek Disposal Area, May 2005



Looking west from Atkinson Creek Disposal Area at Atkinson Creek and Colorado Highway 141 overpass.

4.1.6 Recommendations

This EPA Five-Year Review makes no recommendations for the Atkinson Creek Disposal Area.

| Table 4.1 Atkinson Creek Disposal Area | | |
|---|-----------------------------|--|
| RAP Requirement | Required Date of Completion | Site Status May 2005 |
| Remove Raffinate Crystals and Contaminated Soils: Place in Designated Disposal Areas; Place Soil Cover and Re-vegetate. | Completed by December 1993 | Atkinson Creek Disposal Area Remediated Pursuant to RAP. |

4.2 Club Ranch Ponds Area

4.2.1 History

The Club Ranch Ponds Area consists of six unlined liquid waste disposal ponds located down valley from the Uravan Mill site and ancillary disposal areas. The Club Ranch Evaporation Ponds were constructed in the early 1960s to serve as both evaporative and seepage discharge ponds. The ponds were excavated into gravel terrace deposits of the

San Miguel River. The depths of the ponds ranged from approximately eight-feet to almost thirty-feet. At the time of site cessation of operations, Umetco estimated that the ponds contained approximately 560,000 cubic yards of raffinate crystals and 30 million gallons of liquid. Contaminants were identified in the alluvial gravels and the underlying Kayenta Formation. There was no evidence of seepage into the San Miguel River along the pond.

4.2.2 Remedial Objectives

In the Remedial Action Plan, the State of Colorado Department of Public Health and Environment selected excavation and on-site disposal of raffinate crystals in the Burbank Quarry, an approved raffinate crystal storage area, and disposal of other contaminated soils in the Tailings Piles on Club Mesa as the remedy for the Club Ranch Evaporation Ponds Area. The objectives of this remedy were to remove the source of potential future contamination of the Kayenta-Wingate aquifer and the San Miguel River.

4.2.3 Site Status and RAP Requirements

New evaporation ponds, called Club Ranch Evaporation Ponds CRP #7 and CRP #8, were constructed in the fall of 1987 and the spring of 1988 in order to contain hillside seepage liquids and to contain liquids transferred from the old, unlined Club Ranch Evaporation Ponds. CRP #7 and CRP #8 ponds were constructed in the former Uravan housing area called New Trailer Court and H & J Blocks. CRP #7 and CRP #8 were constructed in conformance with state and federal requirements in order to preclude discharge of mill related liquids. The liquids remaining in the unlined Club Ranch Evaporation Ponds were transferred into geo-synthetically lined CRP #7 and CRP #8 in 1988. Three additional Club Ranch lined ponds, CRP #1, CRP #4 and CRP #6 were constructed during 1991 and 1992 for the management of Uravan collected contaminated liquids from hillside seepage, surface water run-off, and pumped ground water for management by evaporation. Evaporative pond construction was completed with these three additional ponds.

CRP #1, CRP #4, CRP #6, CRP #7 and CRP #8 were lined with a clayey material, a low permeable geo-membrane with leak detection system. After the liquids are evaporated, the residues and liners are to be removed and encapsulated in a Club Mesa repository. Any contaminated soils are to be removed in accordance with criteria set forth in the Remedial Action Plan and the area re-graded and vegetated.

Initial removal of the raffinate crystals and associated contaminated soils commenced during the fall of 1989. A total of 408,000 cubic yards was removed by mid-1991. Removal of raffinate crystals is complete for the previous pond locations. The Remedial Action Plan required the removal of all crystals and reconstruction of all of the Club Ranch Ponds by December 31, 1991. A revision to the Remedial Action Plan implementation schedule for construction of the final Club Ranch Ponds CRP #1, CRP #4 and CRP #6 was approved, which allowed for their delayed construction.

In 1997, contaminated ground water was encountered in the alluvial materials on top of the bedrock in the original six unlined Club Ranch Ponds. This ground water was intercepted and placed in evaporation ponds CRP #7 and CRP #8 for management. Final reclamation of the area will be undertaken after completion of valley ground water cleanup and will include re-grading and vegetation of the disturbed areas.

Contaminated alluvial materials totaling about 33,000 cubic yards were removed from unlined Club Ranch Ponds CRP #2, CRP #3, and CRP #5 during 1998. Excavation continued until underlying bedrock was encountered. This action removed a significant source of contamination from the Club Ranch Evaporation Pond Area. Dikes around these partially mitigated ponds were permitted to remain in place to collect precipitation that is collected in dewatering points, e.g., trenches in shallow alluvium, and immediately transferred to the lined Club Ranch Evaporation Ponds. Final removal of all contaminated soils will be undertaken during the phased removal of the lined Club Ranch Evaporation Ponds that will commence following completion of ground water remediation program in approximately 2007.

In 1999, Umetco installed a manually enhanced evaporation system in Club Ranch Pond CRP #8 to determine whether water pumped through spray heads would result in a significant increase in water evaporation. A pilot study indicated that evaporation was increased from 1 gallon per minute per acre to 2 gallons per minute per acre. Umetco asked for and received permission for the State of Colorado Department of Public Health and Environment in 2000 to modify CRP #8 accordingly. Club Ranch Pond CR #8 was outfitted with the evaporative spray system and operated from 2000 to 2005 with varied results and operational and maintenance issues.

CRP #7 was taken out of service in 2001 when the liner and leak collection system was removed. A total of 41,000 cubic yards of contaminated materials was removed from the dikes of CRP #3, from the banks of the San Miguel River and from CRP #7 in 2001.

Since 2001, exploratory trenches have been excavated into the gravel alluvial materials in the former pond location and in CRP #6 and CRP #7 for the purpose of determining the extent of potential contamination and any potential impacts on ground water and the management of encountered contaminated ground water is in Club Ranch Ponds CRP #1, CRP #4 and CRP #8. Contaminated materials have been or will be excavated and placed into the Club Mesa Repositories approved for their disposal.

4.2.4 Summary of Site Visit Observations and Findings

During the site visit on May 11, 2005, the three remaining lined Club Ranch Evaporation Ponds: CRP #1; CRP #4; and CRP #8 were inspected. CRP #1 and CRP #8 visually appeared to be in fair condition. While no visible defects were observed during this inspection, weathering and operational wear was apparent. However, a detailed inspection conducted by Umetco personnel on May 12, 2005 identified two liner failures

in CRP #8 and one liner failure in CRP #1. The liner failures of CRP #1 and CRP #8 had occurred on the pond's crest and were not within the ponds. Club Mesa Evaporation Ponds CRP #1 and CRP #8 liners failures are not scheduled for repair at the time of this report, but are scheduled for excavation and removal as soon as possible. Information obtained from site personnel indicated that the ponds are inspected regularly and the leak detection system has seen no significant change in collected liquids beyond that which is expected, i.e. 5 gallons per minute that would require activation of the Liner Failure Contingency Plan. In addition, site personnel indicated that none of the three lined Club Ranch Evaporation Ponds had ever overflowed or otherwise released water to the San Miguel River.

The inspection of May 11, 2005 indicated that Club Ranch Pond CRP #4 had suffered significant liner failure due to excessive liner tension forces imposed during a period in which the pond was left empty and allowed to go through a series of temperature extremes. The temperature extremes created a condition that allowed CRP #4 liner to "trampoline" or otherwise become stretched beyond the support of its sub-grade. When the stressed CRP #4 was filled during the winter/spring period of 2004/2005, the stress liner failed in at least eight locations. Liner failure occurred in parent material, fusion welds and extruded welds. The majority of the liner failures were on the crest or outside of CRP #4 containment bowl. Two of the eight liner failures were within CRP #4 containment bowl, but were located approximately two-feet above pond water line. Inspection of CRP#4 leak detection sump indicated presence of liquids, but not in quantities or volumes that would trigger Liner Failure Contingency Plan. Club Ranch Evaporation Pond CRP #4 has been taken out of service, drained and scheduled for excavation and removal with disposal of its liner and any contaminated materials to an approved on-site Club Mesa Repository (B-Plant Repository). Reference Umetco UraVan Club Ranch Ponds Synthetic Liner Inspection Report, dated May 20, 2005.

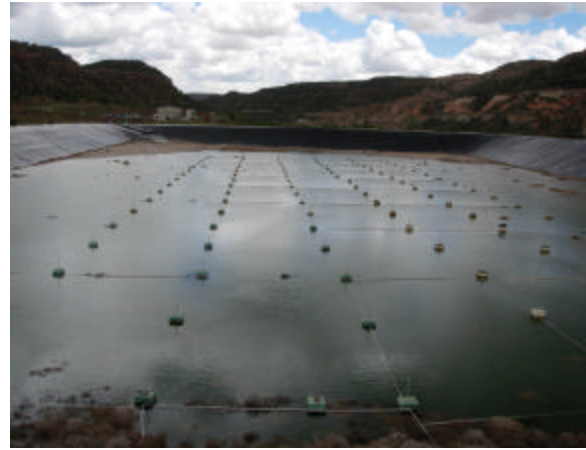
Ground water is still being pumped into two of the lined Club Ranch Ponds: CRP #1 and CRP #8. Evaporation of collected water has not generated significant quantities of raffinate crystals.

4.2.4 Photographs

The photographs taken on May 11, 2005 presented below illustrate the existing conditions of the three remaining Club Ranch Ponds. Photographs also illustrate some of the liner failures observed during this Five-Year Review site visit.



Club Ranch Ponds CRP #8, CRP#1
and CRP#4



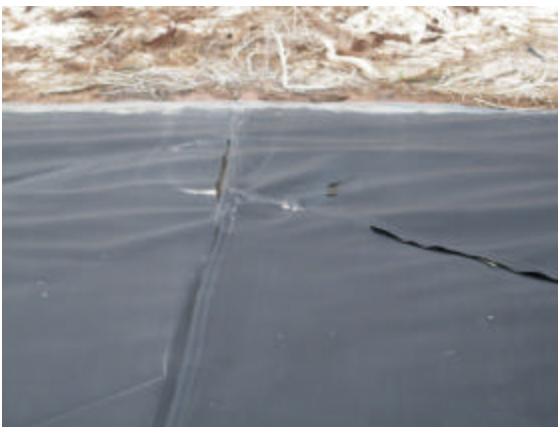
Club Ranch Pond CRP #8
Evaporative Spray system



Club Ranch Pond CRP #8



CRP #4 Interior Liner Trampoline Effect



Club Ranch Pond CRP #4
Interior Liner Failure



Club Ranch Pond CRP #4
Exterior Liner Failure

4.2.5 Recommendations

It is recommended that the Club Ranch Pond CRP #4 be removed from service immediately (This action was implemented as of May 20, 2005) and be excavated and removed during the 2005 remediation season with disposal in an on-site approved repository (B-Plant Repository). Club Ranch Ponds CRP #1 and CRP #8 should be repaired at the earliest time achievable. Club Ranch Ponds CRP #1 and CRP #8 should be inspected daily for liner deterioration and failure and their leak detection systems inspected and evaluated on a weekly basis until removed from operation.

| Table 4.2 Club Ranch Ponds Area | | |
|--|--|---|
| RAP Requirement | Required Date of Completion | Site Status May 2005 |
| Evaporate all Liquids in Place; Remove Raffinate Crystals and Place in Designated Disposal Areas; Verify Mitigation with Radiological Survey; Remove Sub-Grade Contaminated Soils and Place in Designated Disposal Areas; Recontour and Revegetate Mitigated Pond Areas; and Issue construction Completion Report. | RAP Modified Completion by December 1992 | Original Club Ranch Ponds Have Been Mitigated and Closed Pursuant to RAP Requirements, except for final recontouring and revegetation. Completed by 1992. |
| Construct New Evaporation Ponds per Specifications, Manage Ground Water Storm Water Run-Off and Hillside Seepage Liquids; Properly Close Club Ranch Evaporation Ponds per RAP Requirements; and Recontour and Revegetate Club Ranch Pond Area | RAP Modified to Allow On-Going Utilization of Club Ranch Ponds for Evaporation of On-Site Generated Liquids. | Club Ranch Evaporation Ponds CRP-1 and CRP-8 are in Use. CRP-4 Scheduled for Removal Summer 2005. Enhanced Evaporation Systems to Be Installed in CRP-1 and CRP-8 During Summer 2005. |

4.3 River Ponds Area

4.3.1 History

The River Ponds Area consisted of seven small ponds constructed along the San Miguel River adjacent to the mill. Five of the ponds were located on the mill side (south side) of the river and two ponds were located on the north side of the river adjacent to Colorado Highway 141. These ponds were constructed within old tailings piles by excavating into and, in some cases, through the tailings. The exposed surfaces of the excavations were then mantled/covered with natural soils. The five ponds on the mill side of the river were used as settling basins for liquids collected within the mill area and stored there prior to discharge to the river. The two ponds on the north side of the river were used to clarify treated process liquors prior to discharge. These ponds contained neutralized sludge from clarification operations. Umetco estimated that about 290,000 cubic yards of mill wastes and contaminated soils were contained in the River Ponds Area. Seepage of liquids from the River Ponds Area to ground water, and eventually to the San Miguel River, was estimated at 10 to 40-gallons per minute when they were in use.

4.3.2 Remedial Objectives

In the Remedial Action Plan, the State of Colorado Department of Public Health and Environment selected excavation of all sludges and tailings and on-site disposal in the Tailings Piles of Club Mesa as the Remedy for the River Ponds Area. The objectives of this remedy were to remove the source of potential future contamination of the ground water and the San Miguel River.

4.3.3 Site status and RAP Requirements

Initial removal of the River Ponds started in 1988 and was completed in mid-1989. These materials were placed into Club Mesa Tailings Piles #1, #2 and #3. Excavation was completed down to the water table. Umetco subsequently constructed rock berms to trap sediment carried by the San Miguel River during high flows. Vegetation has re-established itself in the River Ponds Area. The Remedial Action Plan called for final reclamation by December 31, 1991. A final construction report was submitted to the State of Colorado Department of Public Health and Environment in Mid-1993. With the acceptance of the final construction report, this component was 100 percent complete as of December 1993.

No further activity has been undertaken at this site since the last Five-Year Review (1999/2000) was prepared.

4.3.4 Summary of Site Visit Observations and Findings

Visual observations during the site visit of May 11, 2005 found the River Ponds Area to be restored to a condition comparable to surrounding areas not included in the River Ponds Area. The San Miguel river has incorporated the River Ponds Area into its course. Vegetation has re-established itself and visually appeared to be healthy. Tailings, discoloration, or other signs of vegetation stress and/or contamination were not observed.

4.3.5 Photographs

Photographs taken on May 11, 2005 are presented below and illustrate the completed status of the River Ponds Area.



River Ponds Area 1 of 2



River Ponds Area 2 of 2

4.3.6 Recommendations

None noted

| Table 4.3 River Ponds Area | | |
|--|---|--|
| RAP Requirement | Required Date of Completion | Site Status May 2005 |
| All Tailings, Liquids and Contaminated Materials to be Removed and Disposed of in Designated Disposal Areas; Pond Area to be Surveyed for closure Criteria Using Radiological Survey Methods; Pond Areas to be Graded and Soil Capped; and Revegetated | Milestone Completion Was Accomplished by 1989 | River Ponds Area Completed Pursuant to RAP Requirements. Ongoing Inspection and Monitoring Continue. |

4.4 Club Mesa Tailings Piles

4.4.1 History

The Club Mesa Tailings Piles at Uravan were started in the mid-1950s to store tailings generated by the Uravan Mill. The Tailings Piles are located on Club Mesa above the Uravan Mill site. The Club Mesa Tailings Piles were constructed using the upstream method whereby the tailings slurry was pumped from the mill to the Tailings Piles and deposited through spigots placed along the tailings delivery line. The embankment raises are constructed from tailings sands that were regraded, placed, and compacted.

Prior to 1980, the downstream slopes on the tailings embankments varied from approximately 1.5 (H) : 1 (V) to 3 (H) : 1 (V). As the height of the embankment increased, there was concern for stability of the embankments. Consequently, in 1980, rock fill berms including a drainage blanket for seepage control were constructed to buttress the lower portions of the Tailings Piles. Horizontal drains to promote drainage of the tailings were also installed but were ineffective.

Observed impacts from the existing tailings disposal system included seepage of contaminated liquids into the Club Mesa bedrock; erosion and transport of tailings material away from the disposal area by wind and water action; and radon emanation from the Tailings Piles.

4.4.2 Remedial Objectives

In the Remedial Action Plan, the State of Colorado Department of Public Health and Environment selected cessation of discharge to the Tailings Piles, removal of liquids, and the covering of the slopes of the Tailings Piles material prior to final reclamation as the

remedy for the Tailings Piles. The objectives of this remedy were to minimize surface water infiltration, seepage from the Tailings Piles, wind and water erosion, and radon emanation from the Tailings Piles.

4.4.3 Site Status and RAP Requirements

Remedial activities set forth in the Remedial Action Plan for the tailings piles of Club Mesa include dewatering, pile reshaping, buttress protection, toe drain system maintenance, top and side slope cover construction, and storm water drainage diversion. The Remedial Action Plan calls for dewatering through natural seepage enhanced by surcharging caused by additional materials placed on the piles. The piles are to be resloped, contoured, and rock fill buttress covered for increased stability. A final protective cover is to be placed which is engineered to mitigate radon emanations, to control erosion and to mitigate seismic motions. Drainage diversion channels will eliminate storm water and snow melt run-on from up-gradient areas. Seepage liquids are to be collected where possible and transferred to the Club Ranch Ponds for evaporation.

The Remedial Action Plan describes six components items for the Club Mesa Tailings Piles:

1. Surface water removal;
2. Sloping and Contouring;
3. Constructing rock fill buttress and toe drain;
4. Constructing side slope protective cover;
5. Emplacing top covers; and
6. Constructing Drainage diversion.

Components 1 through 4 have been completed. The side and top covers, except for riprap, have been placed on Tailings Pile #3. The storm water diversion channel system has been constructed for Club Mesa Tailings Piles 1, 2 and 3. Components 4 and 5 have been constructed, except for placement of portions of the rock cover. Component 6 will be completed upon the closure of the B-Plant Repository. Geotechnical instrumentation was installed in the Club Mesa Tailings Piles.

The top of Tailings Piles 1 and 2 is the final repository for tailings and contaminated soils from the valley areas and Club Mesa. The placement of contaminated soils and other materials on Tailings Piles 1 and 2 was completed, except for portions of the final rock cap materials.

Repository construction in the B-Plant area began in 1998 with the starter berm and return water pond. Operations and placement of contaminated materials in the B-Plant repository began in 1998 and continues to date. A toe drain system was also installed in the B-Plant Repository Area. This repository will accept contaminated materials from the final reclamation of the Club Ranch Ponds and has a designed capacity of approximately 1.8 million cubic yards of waste material.

4.4.4 Summary of Site Visit Observations and Findings

The joint separation on Tailings Pile 3 noted in the 1999/2000 Five-Year Review has been mitigated. Joint separation was due to overlooking and adjoining bedrock displacement and not movement of the tailings pile. Inspection of Tailings Pile 3 indicated a stable and well drained cap system.

Seeps from Tailings Piles 1, 2 and 3 noted in the 1999/2000 Five-Year Review have been mitigated to an extent. However, as observed during the May 2005 site visit, collection of possible tailings piles seeps with meteoric water was present in Sump #1. Prior to the de-commissioning of the scheduled Sump #1 in FY2005; Umetco needs to confirm mitigation methods and performance on measures implemented to stop seeps from the Club Mesa Tailings Piles have been achieved.

Club Mesa Tailings Piles 1, 2 and 3 are constructed well. Placement of rock cap material is not completed as of May 2005. Storm water run-on channels are constructed sufficiently to divert precipitation events. Storm water run-off channels are essential complete except for B-Plant Repository and portions of the top rock caps of Tailings Piles 1, 2 and 3.

A storm water erosion feature of some significance was noted coming off the northeast face of Tailings Piles 1 & 2 adjoining the Club Mesa Area. This erosion feature should be inspected and repaired as needed.

4.4.4 Photographs

The below Photographs taken on May 11, 2005 illustrate current visual conditions for the Club Mesa Tailings Piles.



Club Mesa Tailings Piles
Cap Materials Stock Pile



Photo 1 of 4 of Tailings Pile 3 Repair
of Suspected Joint Separation



Photo 2 of 4 of Tailings Pile 3 Repair of Suspected Joint Separation



Photo 3 of 4 of Tailings Pile 3 Repair of Suspected Joint Separation



Photo of Tailings Pile 3 Repair of Suspected Joint Separation



Club Mesa Storm Water Run-Off Control Feature



Club Mesa Tailings Piles 1 & 2 Storm Water Run-Off Control



Club Mesa Tailings Piles 1& 2 Storm Water Run-Off control



Club Mesa Tailings Pile 3 Storm
Water Run-Off Control Feature



Club Mesa Storm Water Run-Off
Erosion/Washout Feature



Operating B-Plant Repository



Club Mesa Tailings Pile 3
Partially Capped Repository



Club Mesa Tailings Pile 1 & 2
Partially Capped Repository



Club Mesa Tailings Pile 3
Partially Capped Repository



Club Mesa Tailings Pile 1 &2
Seep Collection Sump #1



Example of Club Mesa Tailings
Piles 1 &2 Seepage Staining

4.4.5 Recommendations

Further investigation and mitigation of Club Mesa Tailings Piles seepage is required, as based upon observations made of continued collection of liquids (rainwater, etc.) within Sump #1.

Club Mesa Tailings Piles 1 and 2 and Club Mesa Area north facing storm water erosion features require inspection, maintenance and repair.

| Table 4.4 Club Mesa Tailings Piles | | |
|--|--|--|
| RAP Requirement | Required Date of Completion | Site Status May 2005 |
| Design and Construct UraVan Site Disposal Repositories on Club Mesa with Storm Water Run-On and Run-Off Control Features; Placement of Contaminated Materials Pursuant to RAP Requirements; Manage and Inspect Tailings Piles Pursuant to RAP Requirements; Place Soil and Rip Rap Protective Cover Systems; Revegetate and Continued Long Term Inspection and Monitoring. | Initiate Construction and Operations of Tailings Piles by 1988. On-Going Operations, Maintenance, Inspection Until Completion of On-site Remediation Activities. | Tailings Piles Have Been Constructed and Operated in Accordance with RAP Requirements. Ongoing Activities are Scheduled to Complete Site Tailings Piles Cap System Construction. |

4.5 Club Mesa Area

4.5.1 History

The Club Mesa Area is located upslope from Tailings Piles 1, 2 and 3. This area was used primarily for evaporation of raffinate. Mounds of raffinate crystals formed around the spray nozzles within the spray area. As part of the raffinate spray process, two-clay lined storage ponds were constructed upslope of the raffinate spray area. The purpose of these ponds was to provide hydrostatic head for the spray system. Neutralized sludge excavated from the River Ponds Area was also placed in the Club Mesa Area.

Umetco estimated that approximately 484,000 cubic yards of contaminated materials were present in the Club Mesa Disposal Area. These Materials included 250,000 cubic yards of raffinate crystals; 150,000 cubic yards of neutralized sludge; 40,000 cubic yards of contaminated pond material; and 44,000 cubic yards of contaminated soils in the fringe area.

Superficial and subsurface contamination occurred as a result of the raffinate spray process. Superficial contamination is due to the presence of the raffinate crystals, in addition to the windblown spray which contaminated soils in the adjacent fringe area. Subsurface contamination is caused by seepage of excess spray liquids into the underlying soils and bedrock through the unlined surface of the spray area.

4.5.2 Remedial Objectives

In the Remedial Action Plan, the State of Colorado Department of Public Health and Environment selected excavation and on-site disposal of raffinate crystals in the Burbank Quarry, an approved raffinate crystal storage area, and disposal of other contaminated soils in the Tailings Piles on the Club Mesa as remedy for the Club Mesa Area. The objective of this remedy was to remove the source of future potential contamination of surrounding soils and the underlying soils and bedrock.

4.5.3 Site Status and RAP Requirements

Pursuant to the Remedial Action Plan guidance;

- Removal of neutralized sludge and other contaminated material began in June 1989 and was completed in 1992;
- Initial removal of raffinate crystals from the Club Mesa began in the summer of 1990 and was completed in mid-1992; and
- The final removal of the raffinate crystals that are resting on the bedrock was completed in 1994.

Approximately 3,750,000 cubic yards of contaminated material was removed from the Club Mesa Area. Mines and portals encountered during excavation and removal of materials from Club Mesa were sealed with earthen materials. The Remedial Action Plan

required that material removal activities be completed by December 31, 1994. This activity was completed in accordance with the revised milestone Remedial Action Plan schedule by December 31, 1997 with the acceptance by the State of Colorado Department of Public Health and Environment of the construction completion report. Final closure activities for the Club Mesa Area included construction of a storm water diversion structure and sediment collection areas; placing clean fill rock mulch, and reseeding the fill areas. This activity is complete.

During 2000, seventeen borings were drilled into the mine workings on Club Mesa for the purpose of evaluating and managing contained contaminated liquids. Five of the seventeen borings were selected for pumping and conveyance of mine workings liquid. Raffinate solution in the mine workings have been extracted and transferred to the Club Ranch Ponds for evaporation. Approximately 500,000 gallons of raffinate contaminated liquid was pumped from the mine workings during 2000 and 2001. Umetco has not reported any additional liquids extracted from the Club Mesa Area mine workings since the fourth quarter of 2001. Mine Features have been closed and sealed in accordance with State of Colorado Division of Minerals and Geology mine closure specifications and guidance documents.

Umetco has stated that the Club Mesa Area is one-hundred percent complete.

4.5.4 Summary of Site Visit Observations and Findings

Visual inspection during the site visit of May 11, 2005 indicated that the Club Mesa Area is fully remediated. No signs of remaining contamination (raffinate crystals, discolored soils, ponds, etc.) were observed during the visit. Vegetation has established itself and is consistent with surrounding non-Club Mesa Area areas. The vegetation appeared to be healthy. No open mine features were observed in the Club Mesa Area.

4.5.5 Photographs



Club Mesa Area Soil/Rock Cap
and Re-Established Vegetation



Club Mesa Storm Water
Control Feature

4.5.6 Recommendations

No recommendations are noted.

| Table 4.5 Club Mesa Disposal Area | | |
|--|--|--|
| RAP Requirement | Required Date of Completion | Site Status May 2005 |
| Remove Raffinate Crystals and Contaminated Soils and Place in Burbank Repository Pursuant to RAP Requirements; Survey Mitigated Area Utilizing Radiological Survey Methods; Construct Storm Water Run-On and Run-Off Control Features; Place cover Soils and Revegetate. | Club Mesa Disposal Area Mitigation was Completed to Modified RAP Implementation Schedule, December 1997. | Club Mesa Disposal Area has been Remediated Pursuant to RAP Requirements. Long Term Inspection and Maintenance are On-Going. |

4.6 Uravan Mill Areas

4.6.1 History

The Mill Areas include the A-Plant in the valley northwest of the Club Mesa Tailings Piles; the B-Plant; Ore Stockpile Area; Barrel Storage Area; a Heap Leach site on a bench below and east of Club Mesa Tailings Pile 2; and a Bone Yard for miscellaneous scrap equipment located west of Tailings Pile 2. These areas had all been impacted by the presence of radioactive material as a result of the Uravan operations.

4.6.2 Remedial Objectives

In the Remedial Action Plan, the State of Colorado Department of Public Health and Environment selected excavation and on-site disposal of contaminated equipment, structure, waste materials, contaminated soils and ancillary contaminated materials into the Club Mesa Tailings Piles, the Burbank Quarry, or a disposal site in the Elk Claim Area as the remedy for the Mill Area. The objectives of this remedy were to remove the source of future potential contamination of surrounding soils and the underlying soils and bedrock.

4.6.3 Site Status and RAP Requirements

Remedial activities in the Mill Area were initiated in 1987. Initial activities included the removal of the Ore Stockpile, Barrel Storage, Heap Leach site, and the Bone Yard materials that totaled 160,000 cubic yards. Uranium and /or vanadium ores and mill reagents were relocated and processed at the United States Nuclear Regulatory Commission licensed White Mesa uranium/vanadium mill in Utah. These activities are completed.

The mill process area consisted of the A-Plant and B-Plant and included the uranium and/or vanadium milling systems and ancillary facilities located along the San Miguel River valley floor at the base of Club Mesa and the facilities located on the canyon face and lower bench immediately next to the Club Mesa Tailings Piles. The mill system included ore receiving bins and crushing and sampling plant; aerofall grinding circuit; crushed and ground ore storage bins; hot sulfuric acid leach circuit; counter-current decantation circuit; sulfuric acid generation plant; uranium ion exchange circuit; uranium precipitation and calcining circuits; vanadium salt roast leach circuit; vanadium fusion circuit; metallurgical control laboratory; and solution transfer system. The mill system also included ancillary facilities such as reagent storage and mix systems, fuel distribution/storage systems; steam generation systems; electrical distribution systems; equipment maintenance facilities; and office and warehouse facilities. Mill operations facilities consisted of maintenance; office; warehouse; electrical; and liquid transfer systems.

Mill decommissioning was conducted in accordance with a detailed plan submitted to and approved by the State of Colorado Department of Public Health and Environment. Decommissioning included the management and handling of such items as PCBs and asbestos containing materials during on-site abatement operations; and the demolition of over 50 major Uravan mill site buildings and operations support structures.

Decommissioning of the mill process systems was initiated during 1995 and involved demolition of mill circuits; ancillary mill operations facilities; structural foundations; and removal and cleanup of associated contaminated soils. Mill demolition is complete and contaminated soils removal is complete. Contaminated soil removal was completed in the A-Plant Area during the second quarter of 1999 and in the B-Plant Area in the third quarter of 1999. Replacement runoff control ponds were constructed in the A-Plant Area in 1998. The Community Center Building and the Boarding House were remediated and renovated in 2000.

Tailings materials under County Road EE22 were removed during 2001. Upon completion of removal activities, the area was inspected and approved by the State of Colorado Department of Public Health and Environment on-site coordinator and the roadway was reestablished with borrow fill and placement of road-base gravel material.

A total of 4,760 cubic yards of contaminated materials were removed from the roadbed and placed in the B-Plant Repository.

A small evapo-transpiration (E/T) test plot was constructed in the facility of the Bone Yard during the 2001/2002 to evaluate the feasibility of controlling toe drain fluids. Approximately 29,200 gallons of toe drain fluid were directed to the E/T system during the spring of 2002 to promote the natural establishment of native vegetation species in the area.

Mill Area remediation continued with the removal of contaminated soils during 2002. Contaminated soils and materials were placed in the B-Plant Repository. A-Plant Area and B-Plant Area confirmation Investigation reports were approved and final reclamation grading and drainage activities were completed in 2003. Reclamation with seeding and placement of soil amendments for the A-Plants and B-Plant Areas began in the spring of 2003 and completed in the fourth quarter 2003.

4.6.4 Summary of Site Visit Observations and Findings

A site visit was made on May 11, 2005. Visual observations indicated that remedial efforts for the Uravan Mill Areas are essentially complete. Storm water diversions and control features are in place and appear to be functioning as design. Reclamation of the Uravan Mill Area appears to be established and is similar to other non-Uravan surrounding area. Except as noted in this review report, the Uravan Mill area remediation is complete.

4.6.5 Photographs



Reclaimed A-Plant Areas and
Mill Hillside Areas



Reclaimed Mill Hillside Area with Storm
Water Run-Off Erosion Control Features



Reclaimed B-Plant Areas and
Bone Yard Areas



Toe Drain Evapo-Transpiration
Test Plot Near Bone Yard Area

4.6.6 Recommendations

None noted.

| Table 4.6 Mill Areas | | |
|--|--|---|
| RAP Requirement | Required Date of Completion | Site Status May 2005 |
| Remove All Contaminated Equipment, Soils and Materials and Place in Designated On-site Disposal Areas; Demolish Mill Structures and Place Demolition Debris in Designated On-Site Disposal Areas; Verify Mitigation Utilizing Radiological Survey Methods; Construct Storm Water Run-On and Run-Off control Features; and Recontour and Vegetate Mill Areas. | Mill Areas were Mitigated Pursuant to RAP and Radioactive Materials License Requirements – 1989. | Mill Areas have been Fully Mitigated. Ongoing Inspection and Maintenance Activities per RAP Requirements. |

4.7 Town and Adjacent Areas

4.7.1 History

The town of Uravan occupied the San Miguel River valley area just northeast of Tailings Piles 1 & 2. Adjacent areas are:

- The town dumps (Old Town Dump and New Town Dump) which are located on the south side of the San Miguel River, south of Colorado Highway 141; and west of Club Ranch Pond #4; and
- Areas adjacent to the town affected by deposition by windblown materials, including the Hieroglyphic Canyon, San Miguel River, and Atkinson Creek drainage.

Tailings were used in localized construction activities and were spilled from delivery pipelines running through the town area. Wind- and surface water transported tailings were found in the town and adjacent drainages. Remnant tailings were also placed and located under Colorado Highway 141.

4.7.2 Remedial Objectives

In the Remedial Action Plan, the State of Colorado Department of Public Health and Environment selected excavation and on-site disposal of Town Area contaminated materials; waste from the Town Dumps; remnant tailings; streams and storm water drainage deposits; and windblown material into the Club Mesa Tailings Piles repositories, the Burbank Quarry, or disposal site in the Elk Creek Claim Area as remedy for the Town and Adjacent Areas. The objectives of this remedy were to remove the source of future potential contamination of surrounding soils; underlying soils; ground water; and surface water.

4.7.3 Site Status and RAP Requirements

All housing structures have been removed from the Town of Uravan. Contaminated soils have been removed and transported to the Club Mesa Tailings Piles. Approximately 260 structures were removed and approximately 210,000 cubic yards of contaminated soils were excavated from 1987 through 1994. The Town Area was graded and revegetated in 2000 after soil verification studies were completed and accepted. A historic kiosk and overlook parking lot were constructed for public viewing and information.

Two historic structures (Community Center and Boarding House) in the Town of Uravan have been fully remediated and renovated. Since the completion of the restoration of the Uravan historical structures in 2000 and the completion of radiological risk assessments in 2004, Umetco and the Rimrock Historical Society are in the process of transferring ownership of the historical structures and associated property to the Rimrock Historical Society for future use and preservation care. The Rimrock Historical Society is seeking a 2005 funding grant for exterior renovation of the Community Center Building. A

land/structure ownership transfer of the historical properties is being negotiated with Montrose County, Colorado. The ownership transfer will include the placement of an institutional control on the property. As part of the transfer due-diligence, an active radon mitigation system was installed in the Community Center Building during the third quarter of 2004 and minor cleanup activities were conducted in the non-Remedial Action Plan areas within the transfer boundary during the fourth quarter of 2004. These minor general cleanup activities included areas southeast of the Community Center and Boarding House Buildings, including the former Gym area and E-Block area.

Materials in the Town Dumps have been characterized in accordance with the Remedial Action Plan requirements. Mill related contamination was identified in the Town Dumps. These materials were excavated, removed and placed in the Club Mesa B-Plant Repository. Approximately 260,000 cubic yards of contaminated materials were removed from the Town Dumps. Final grading and seeding of the area was completed in 2000.

Dispersed deposits adjacent to Uravan were identified, removed and disposed in the Club Mesa Tailings Repositories. These areas include portions of Colorado Highway 141; Montrose County Road Y-11 and EE22; the Mill Hillside and Water Storage Ponds adjacent to Hieroglyphic Canyon. Approximately 65,000 cubic yards were removed from these areas. Remnant tailings were excavated, removed and placed in the Club Mesa B-Plant Repository from the entrance road to the Uravan Site and Town and from within the Town of Uravan – this Remedial Action Plan activity is complete. All tailings material in the shoulder of Highway 141 was excavated, removed and placed in the Club Mesa B-Plant Repository in 2000. The remediation and reclamation of these areas are complete, except for portions of Colorado Highway 141. The State of Colorado Department of Transportation has elected to remediate portions of Colorado Highway 141 where tailings materials remain underneath the highway roadbed. This area remains an active site as defined by the Remedial Action Plan and Consent Decree.

Stream and storm water drainage deposits include sediments in Atkinson Creek and Hieroglyphic Canyon streambeds. Radiological surveys have indicated that no significant contamination is present within the Atkinson Creek Streambed. Contaminated materials in the Hieroglyphic Canyon streambed near its confluence with the San Miguel River have been fully remediated and were completed in 1994. Assessment of the upper reach of the Hieroglyphic Canyon indicates that no significant contamination is present in the streambed and excavation of the streambed contaminated materials would result in significant environmental impacts to the water way and its ecology. Discrete deposits of radioactive soils were identified near the mouth of Hieroglyphic Canyon and were, excavated, removed and placed in the Club Mesa Tailings Repositories.

Windblown material identified north and south of the Club Mesa Tailings Piles footprints have been characterized. An area averaging radiation evaluation of these areas is in the process of determining risk and any eventual Remedial Action Plan implications. To date, no remediation has taken place in the Windblown Areas.

Accept as noted above, the Town of Uravan and Adjacent Areas remediation was completed in 2003.

4.7.4 Summary of Site Visit Observations and Findings

The site visit of May 11, 2005 visually found the Town of Uravan and the Adjacent Areas fully remediated, except for the portion of Colorado Highway 141 and the Windblown Areas. No visible signs of remaining contamination, e.g. buildings; drums; equipment; discolored soil; tailings; etc. were observed in these areas during the site visit. Grading and site reclamation and revegetation of the Town of Uravan and Adjacent Areas appeared to have been completed, and healthy-looking vegetation has been reestablished in these areas.

The Town Dumps (Old and New) were excavated down to bedrock, covered with top soil and reclaimed and seeded. Revegetation is fully established and appears to be healthy.

Montrose County Roads Y-11 and EE-22 have been remediated and reclaimed pursuant to the Remedial Action Plan. The roads have been assessed and evaluated with respect to future use. A covenant and institutional control instrument needs to be drafted. These documents need to be finalized to reflect completion of one of the objectives of the Remedial Action Plan with transfer of control and future use maintenance to Montrose County.

4.7.5 Photographs

The photographs presented below illustrate site conditions as observed on May 11, 2005.



Reclaimed Area in the foreground
Is the former Town of Uravan



Reclaimed Uravan Adjacent Area
Historic Buildings and Hieroglyphic Canon



Reclaimed Uravan Old Town Dump



Reclaimed Uravan New Town Dump



In the distance, Un-remediated Colorado Highway 141



North Windblown Area located above The San Miguel River Valley

4.7.6 Recommendations

1. The State of Colorado, Department of Transportation needs to address the tailings remaining beneath Colorado Highway 141 in accordance with the Uravan Remedial Action Plan requirements.
2. Institutional control need to be finalized with Montrose County Board of County Commissioners for the management and future use maintenance of County Roads Y-11 and EE-22.
3. The Windblown Areas still need to be addressed as determined by the completion of on-going assessments and evaluation.

| Table 4.7 Town and Adjacent Areas | | |
|--|---|---|
| RAP Requirement | Required Date of Completion | Site Status May 2005 |
| Remove and/or Excavate Contaminated Soils, Debris and Materials and Place in On-Site Designated Disposal Areas; Verify Remediation by Survey Utilizing Radiological Methods; Construct Storm Water Control Features; and Re-Grade and Revegetate Remediated Areas. | Town and Adjacent Areas were Mitigated Pursuant to RAP Requirements – 1994. | Area Has Been Fully Remediated. On-Going Inspection and Maintenance Activities. |

4.8 Burbank Quarry

4.8.1 History

The Burbank Quarry was intended to be the source of riprap for remedial activities. Random fill and clays were mined from the quarry pit for use in remedial construction. The Burbank Quarry was also to be used as the raffinate repository and may serve as the repository for other wastes as approved by the State of Colorado Department of Public Health and Environment.

4.8.2 Remedial Objectives

In the Remedial Action Plan, the State of Colorado Department of Public Health and Environment selected the placement of raffinate crystals removed from the Atkinson Creek Crystal Disposal Area; the Club Ranch Evaporation Ponds; and the Club Mesa Spray Area in below-grade Burbank Quarry locations. Raffinate crystals were to be dispersed in clay-lined cells that would be capped by earthen materials and riprapped for erosion control and protection. Burbank Quarry cap systems were designed in consideration of the probable maximum precipitation events and maximum credible earthquakes.

4.8.3 Site Status and RAP Requirements

Placement of the Raffinate crystals was initiated in 1989 and was completed in 1992. This RAP activity has been completed.

The raffinate crystals have been capped with an earthen cover in accordance with the Remedial Action Plan requirements. The side slope was completed in 1993. The toe drain was installed in 1998. The top cover was completed in 1999 with the placement of cover riprap rock. The Burbank Quarry – Uravan Title II activity was completed in 1999/2000.

The Department of Energy (DOE) used the upper portion of the Burbank Repository for disposing Title I radioactive materials from the Naturita processing site. Approximately 600,000 cubic yards of radioactive materials were placed in the Burbank Quarry repository. A multi-layered cover, identical to the Uravan Tailings Piles covers, was constructed on top of the placed contaminated materials. Permanent drainage diversion structures and control features were constructed for storm water management to and from the repository. The Burbank Quarry – DOE Title I activity was completed in 1998.

4.8.4 Summary of Site Observations and Findings

A site visit on May 11, 2005 visually found the Burbank Quarry remediation effort complete, reclaimed and secure. Vegetation has been re-established and storm water management features have been constructed and are well maintained. The covers of the upper and lower sections of the Burbank Quarry are contiguous, separated by a fence and surface water diversion features, which divert surface water off of the abutting mesa on the west side of the repository.

4.8.5 Photographs

Photograph presented below illustrate the May 11, 2005 status of the Burbank Quarry Repository:



Burbank Quarry – Uravan Title II
Repository Cap



Burbank Quarry – Uravan Title II
Repository Cap



Burbank Quarry – Uravan Title II and DOE Title I Repository Cap Systems



Burbank Quarry – Uravan Title II and DOE Title I Repository Capped Systems



Burbank Quarry – Uravan Title II and DOE Title I Repository Cap Systems



Burbank Quarry – Uravan Title II and DOE Title I Repository Cap Systems

4.8.6 Recommendations

No recommendations are noted.

| Table 4.8 Burbank Quarry | | |
|--|---|---|
| RAP Requirement | Required Date of Completion | Site Status May 2005 |
| Convert Burbank Quarry to an On-Site Disposal Repository; Construct Disposal Repository meeting RAP and Radioactive Materials License Requirements; Construct Storm Water Run-On and Run-Off Control Features; Place Soil and Rip Rap Protective Cover System; and Revegetate. | Burbank Quarry Disposal Repository was Constructed; Filled and Capped in Accordance with RAP Requirements – 1999. | Burbank Quarry Has Been Fully Remediated. On-Going Inspection and Maintenance Activities. |

4.9 Borrow Areas on Club Mesa

4.9.1 History

The Borrow Areas on Club Mesa are not contaminated. They were intended to be used as sources of the clayey soils and random backfill to be used during remedial activities. The Club Mesa Borrow Area is operated pursuant to the requirement of a Mine Land Reclamation permit issued by the State of Colorado Department of Natural Resources, Division of Minerals and Geology.

4.9.2 Remedial Objectives

Remediation activities at these areas will not be conducted. This area is the intended resource for clayey soils and random backfill to be used in remedial activities. Final mine land reclamation will be accomplished pursuant to the requirements established by the issuance of the Borrow Area Mine land Reclamation Permit.

4.9.3 Site Status and RAP Requirements

Not addressed by this or previous Five-Year Reviews

Three borrow areas exist for the Uravan Site. Two are located on Club Mesa, with one above the Burbank Repository. The third is located in the San Miguel River valley on the east side of Colorado Highway 141, across from the Club Ranch Ponds. The borrow areas on Club Mesa were expanded in 1992, 1997, 2002 and 2003; which includes Kaiser Quarry.

The Kaiser Quarry produces sandstone suitable for erosion protection materials. The Kaiser Quarry is located west of the Club Mesa Area within Umetco's patented Kaiser Claim Boundary.

All of the borrow areas are operated in compliance with the Mine Land Reclamation Permits.

Umetco is planning to expand borrow operations with the development of the Surprise Borrow Area. The BLM and the State of Colorado Mine Land Reclamation Division were contacted for approval to drill exploration borings to locate suitable clay materials on a Uravan Mill claim located to the southeast of the existing Club Mesa borrow area. Pending regulatory approval an exploration program was to be initiated during late 2004 and early 2005.

4.9.4 Summary of Site Visit Observations and Findings

During the site visit of May 11, 2005, the borrow areas on Club Mesa were observed to be in varying degrees of quarry operations and in conformance with the Mine Land Reclamation Permit. The valley borrow area has been reclaimed pursuant to the Mine Land Reclamation Permit.

4.9.5 Photographs



Partially Reclaimed Club Mesa Borrow Area Taken



Stockpiled Repository Cap Materials From Kaiser Quarry on Club Mesa

4.9.6 Recommendations

No recommendations were noted

| Table 4.9 Borrow Areas on Club Mesa | | |
|--|---|-------------------------|
| RAP Requirement | Required Date of Completion | Site Status May 2005 |
| Prepare On-site Borrow Areas in Accordance with State of Colorado Mined Land Reclamation Division Requirements; Process Borrow Area Materials for use On-Site for Disposal Area Soil and Rip Rap Cap Systems; and Reclaim and Revegetate Borrow Areas. | Borrow Areas are being Operated Pursuant to RAP and Colorado Mined Land Reclamation Requirements. Borrow Areas will be Closed at the End of On-site Remediation Activities. | Ongoing. |

4.10 Hillside Seepage and Tailings Liquids

4.10.1 Hillside Seepage

4.10.2 History

Seepage has been occurring intermittently along approximately 4,600 linear-feet of the Club Mesa rim. Seepage occurs near the contact between the Summerville and Salt Wash Formations and exits the valley walls of Hieroglyphic Canyon and the San Miguel River above the A-Plant Area. Some of the Seepage is presently collected in seepage collection systems, including Club Mesa Tailings Piles toe drains. Collected seepage is transferred to the Club Ranch Evaporation Pond for management. The seepage is composed of geochemically-modified tailings solutions from the Club Mesa Tailings Piles and the Club Mesa Spray Area.

Liquids will be forced from the Club Mesa Tailings Piles during dewatering and consolidation; and for some time prior to and after final reclamation activities. Seepage is collected by toe drain system at the base of the slopes of the Club Mesa Tailings Piles and conveyed to the Club Ranch Evaporation Ponds with the Hillside Seepage Collections System liquids.

4.10.3 Remedial Objectives

Remediation activities will minimize the potential for discharge of contaminated surface waters from the site into the San Miguel River. The State of Colorado Department of Public Health and Environment has selected collection and transfer of the Hillside Seepage liquids to the Club Ranch Evaporation Ponds for management.

4.10.4 Site Status and RAP Requirements

Improvements to the Hillside Seepage Collection system were initiated and completed in 1998. The Collection System was removed in 2003. Hillside seepage has declined from 30-gallons per minute to less than 1-gallon per minute. Toe Berm Seepage and Tailings Dewatering systems initially collected 30-gallons per minute. Current collection volumes are estimated at less than 2-gallons per minute. Volumes should continue to decrease as consolidation loads equalize and as remediation and reclamation comes to an end.

The toe drain collection system have been capped and sealed. However, existing toe drain sumps appear to be still collecting liquids.

4.10.5 Summary of Site Visit Observations and Findings

On May 11, 2005, a site visit was made to visually observe Uravan Site conditions and status of Remedial Action Plan activities. Observations of the Hillside Seepage and Toe

Berm Seepage and Tailings Dewatering collection systems areas indicated the presence of seepage liquids at Sump #1 toe drain collection piping. Observations of hillside geological formations also indicated the presence of continuing seepage in areas below the Club Mesa Tailings Piles rim.

4.10.6 Photographs

The photographs presented below illustrate the status of a portion of the Hillside Seepage Collection System and Toe Berm Seepage and Tailings Dewatering Liquids Collection System.



Club Mesa Toe Drain Collection Sump



Club Mesa Toe Drain Collection Sump



Hillside Area Seepage Collection Channel



Hillside Area Seepage Collection Pond

4.10.6 Recommendations

Assessment and evaluation of the Hillside Seepage and Toe Berm Seepage and Tailings Dewatering Liquids collections system should be continued on a regular interval to determine the effectiveness of this collection method.

4.11. Pond Liquids

4.11.1 History

Contaminated liquid contained in the Club Ranch Evaporation Ponds consisted primarily of the toe drain and hillside seepage collected liquids since 1985 and raffinate solution contained in the ponds since the last discharge of raffinate to the ponds in 1984. These liquids seeped into the subsurface at an undermined rate. Pondered water evaporates at a rate of approximately two-gallons per minute per acre.

4.11.2 Remedial Objectives

Remediation activities will minimize the potential for contaminated surface water to be released into the underlying bedrock and aquifer.

4.11.3 Site Status and RAP Requirements

Club Ranch Evaporation Ponds were constructed to manage liquids collected from the Club Mesa Tailings Areas, Toe Berm Seepage and Tailings Dewatering Liquids Collection System, Hillside Seepage Collection System, any other contaminated liquid collected as part of site remedial activities. Collected liquids have been effectively collected and transferred to the Club Ranch Ponds for evaporation. Club Mesa and the River Area Ponds have been fully remediated and are complete.

4.11.4 Summary of Site Visit Observations and Findings

On May 11, 2005, a site visit was made to observe site remedial activities and the status of completed components. Collection of Club Mesa Hillside Seepage and Club Mesa Tailings Piles Toe Drain Liquids has been terminated.

4.11.5 Photographs

Photographs of these systems are presented in the above sections.

4.11.6 Recommendations

An updated assessment and evaluation of the closed collection systems performance needs to be reported to the State of Colorado Department of Public Health and Environment pursuant to the requirements of the Remedial Action Plan.

4.12 Storm Water Surface Runoff

4.12.1 History

Surface water run-off from the Umetco Uravan Superfund Site will continue to occur after remediation and reclamation activities of the site have been concluded. Hydrology studies for the existing and reclaimed facilities were conducted. Water quality of the storm water run-off is governed by Section 5.3.3 of the Remedial Action Plan.

4.12.2 Remedial Objectives

Remediation activities will minimize the potential for contaminated surface water to be released into the San Miguel River. The State of Colorado Department of Public Health and Environment has selected as the remedial choice for surface water management – the construction of a system of storm water run-on and storm water run-off control features that will collect and convey storm water run-on away from remediated features; collect storm water from within the RAP Boundary for management at the Club Ranch Evaporation Ponds until site remediation and reclamation activities are concluded; and collect and channel storm water run-off from the capped repositories surface areas in such a manner to preclude erosion damaged to constructed remedial components and convey those storm waters to the appropriate surface water drainage system.

4.12.3 Site Status and Rap Requirements

The construction and maintenance of the Uravan Superfund Site storm water management system continues as site remedial activities progress. The sizing and materials of construction are consistent with the requirements of the Remedial Action Plan.

4.12.4 Summary of Site Visit Observations and Findings

On May 11, 2005, a site visit was made to conduct a visual inspection of the Uravan Superfund Site Storm Water Management System. Visual observations indicated that ongoing construction and lining of surface water run-off control features are consistent with the Remedial Action Plan. However, an excessive erosion feature was observed on the north side of the Club Mesa Tailings Piles Repository location. This erosion feature is not a part of the designed surface water collection system, but it has occurred due to substantial repository cap run-off into a non-constructed drainage.

4.12.5 Photographs

The photographs of storm water and surface water control features are presented in the previous sections.

4.12.6 Recommendations

Continued inspection should be consolidated to identify and respond to surface water erosion. Repair of identified erosion features should be conducted in a timely manner to prevent potential damage of remedial activities in progress and of completed site remedial components.

4.13 Groundwater

4.13.1 History

4.13.1.1 Salt Wash Member of the Morrison Formation

Seepage from the Uravan Mill operations and waste disposal has infiltrated in to the Salt Wash and historically created a body of perched fluids on Club Mesa. This infiltration primarily consists of raffinate from the Club Mesa Spray Area and seepage from the Club Mesa Tailings Piles. Hydrologic data monitoring wells constructed in the Salt Wash indicate that the areal extent of the fluids is in the area beneath and down gradient from the three Club Mesa Tailings Piles and spray evaporation area. The direction of ground water flow is to the northeast towards the west and south San Miguel River Valley walls and to the walls of Hieroglyphic Canyon. Perched liquids on top of the Summerville Formation have dispersed and no significant seepage has been noted along the canyon valley walls.

4.13.1.2 Kayenta-Wingate Sequence

Umetco's past operations on the Club Mesa and past waste disposal activities pose potential impact to the ground water quality in the Kayenta-Wingate aquifer beneath Club Mesa. Past activities which could potentially impact the aquifer were the use of the Club Mesa Spray Area and Club Mesa Tailings Piles. These activities have ceased and the areas reclaimed.

The low permeability of the Summerville shale formation above the Kayenta-Wingate aquifer prevents significant contaminant transport down to the Kayenta-Wingate. In 1986, Umetco drilled ground water monitoring wells V-768 and V-769 into the Kayenta-Wingate Formation beneath the Club Mesa. These wells showed no contamination at this time.

4.13.1.3 River Valley: Kayenta-Wingate Sequence

Umetco's liquid waste handling and disposal operations in the San Miguel River valley released contaminants into the Kayenta-Wingate aquifer. The most significant contribution to ground water contamination was the disposal of liquid raffinate in the

unlined Club Ranch Ponds. Seepage from the Club Ranch Ponds has been found in ground water monitoring wells beneath and down gradient from the ponds.

The ground water system in the San Miguel River valley is a complex, fractured aquifer that maintains a recharge-discharge relationship with the San Miguel River. The ground water monitoring well system in the river valley has a measured contamination in the fractured aquifer system. This contaminated ground water acts as a source of non-point contamination to the San Miguel River. The sandstone matrix likely produces very little liquid relative to the fractures, and may contribute contaminants to the fracture system at a relatively slow rate.

4.13.2 Remedial Objectives

Remedial activities will minimize the potential for contaminated subsurface waters to be released into the San Miguel River.

Sampling of the Club Mesa ground water wells that monitor the Kayenta-Wingate Formation shall provide data for continuing confirmation that ground water quality in the Kayenta-Wingate Formation beneath the Club Mesa is acceptable.

The Remedial Action Plan activities for the mitigation for Kayenta-Wingate aquifer restoration is to remove and manage fractured bedrock contamination and improve Kayenta-Wingate Formation contained ground water quality to a beneficial use. As stated in the Remedial Action Plan, achieving this goal, coupled with the removal of raffinate crystals and ponded liquids from the San Miguel River valley, will substantially reduce the contaminated non-point load to the river.

4.13.3 Site Status and RAP Requirements

The six Club Mesa Salt Wash ground water monitoring wells were abandoned in late 2003. The six monitoring wells were completed into the Salt Wash Member of the Morrison formation under the Club Mesa. To date, ground water monitoring is performed only with the Points of Compliance monitoring wells.

The Remedial Action Plan requires that Kayenta-Wingate ground water in the Club Ranch Ponds Area be extracted and evaporated. Ground water pumping is to be conducted at a rate of 60-gallons per minute and operational adjustments be made as necessary to maintain optimal system performance. The extracted ground water is to be conveyed to and evaporated in the lined Club Ranch Ponds. Performance of the ground water extraction system is to be evaluated annually.

The initial ground water extraction system was installed in 1991 and upgraded in 1996 and again in 1998. Ground water pumping began in 1991 in accordance with Remedial Action Plan. In 1997, the ground water cleanup effort was evaluated in detail and an optimized system was developed so that contamination liquids from low-permeability

zones in the Kayenta-Wingate aquifer could be extracted. This optimized system was installed in 1998 by drilling and completion of 12 new extraction wells. The change in ground water withdrawal has been effective in reducing contaminant concentrations.

In general, the ground water extraction and Club Ranch Evaporation Pond System has removed approximately 15,000 tons of contaminants from the ground water flow regime. This action has helped reduce contaminant loading to the San Miguel River system. During the past six years, there have been no impacts to the San Miguel River. River standards for aluminum, cadmium, copper, iron, manganese, selenium, uranium, radium, sulfate, and unionized ammonia have not been exceeded.

Because of ground water extraction performance, and the overall effectiveness of the ground water extraction system, Alternate Concentrations Limits (ACL) have been approved and ground water pumping has been discontinued, except for the shallow ground water wells developed in the shallow alluvial deposits beneath the old Club Ranch Ponds. Kayenta-Wingate ground water extraction ended in the fourth quarter of 2003. Umetco is preparing plans for approval to withdraw ground water extraction pumping systems and to effectively abandon the extraction wells in the Club Ranch and San Miguel River valley areas.

4.13.4 Summary of Site Visit Observations and Findings

On May 11, 2005, a site visit was made to the Uravan Superfund site for the purpose of observing on-site remedial activities. The Kayenta-Wingate ground water extraction system and the Club Ranch Evaporation Ponds were being operated in conformance with the Remedial Action Plan. Evaporation of extracted ground water is now limited to Club Ranch Ponds CRP #1 and CRP #8 with pending closure of CRP #4 during 2005.

4.13.5 Photographs

No Photographs were taken of ground water recovery systems during this scheduled Five-Year Review Site Visit.

4.13.6 Recommendations

Evaluation of first Quarter FY 2005 Ground Water monitoring data indicates that ground water has not been adversely affected by Uravan operations when applying Alternate Concentration Limits. No Recommendations are made.

5.0 MISCELLANEOUS REMEDIAL ACTION PLAN REQUIREMENTS

5.1 Requirements

The Remedial Action Plan (RAP) sets forth monitoring and reporting requirements to be performed during the implementation of Uravan Site remedial activities. Environmental and occupational health and safety data are required to be collected, evaluated and submitted annually to the State of Colorado Department of Public Health and Environment for review and approval pursuant to the Consent Decree and Condition 30 of the site radioactive materials license. The five year review process evaluates this environmental monitoring data and worker protection programs to determine if remedial activities at the Uravan Site are protective of human health and the environment. This five year review included the comparisons made by Umetco of the 1987 to 1991; 1992 to 1996 and the 1997 to 2001 data sets for the previous five-year reviews to the current data set maintained by Umetco-Uravan.

5.2 Environmental Review

The Umetco-Uravan Environmental Review evaluates the data collected and presented in the Uravan Annual Reports for the following environmental monitoring activities:

- Metrology
 - Ambient Air
 - External Gamma
 - River Sediment, soils and Grazing Uptake
 - Tailings Pile Number 2 and 3; and the Burbank Repository
 - Rim Erosion Monuments
 - Liquid Waste Management
 - Surface Water Monitoring
 - Ground Water Monitoring
-
- Since June of 1988, no point source air and NPDES permit discharges from the Uravan site have occurred. All remedial activities at the Uravan Site have been conducted with “zero Point-source” discharges to the San Miguel River.

5.2.1 Meteorology

The Uravan Site meteorological database includes temperature and precipitation records from 1961. During the most recent period of record, temperatures ranged from 110° to minus 23° Fahrenheit. Yearly precipitation averages 12 inches to 13 inches with a range of 7.1 inches to 21.2 inches. The maximum 24-hour storm event recorded during the most recent five-year period was 1-inch of precipitation and did not result in a discharge from the remedial activities areas to the San Miguel River. Significant precipitation events near the Uravan Site have caused mud/land slides that have impacted Colorado Highway 141. Significant storm events within the Uravan Site have not impacted the Uravan Site adversely.

5.2.2 Ambient Air Quality

Contaminated material management at the Uravan Site has been ongoing as part of the remedial activities since 1987. Since 1987, over 3,000,000 cubic yards of uranium mill tailings; contaminated soils; demolition debris; and raffinate crystals have been excavated and/or demolished, transported, placed and compacted while conducting remedial operations. The removal of large volumes of contaminated materials and associated cleanup of the remedial areas has resulted in improved air quality, as demonstrated by air-monitoring data collected at the site since 1987.

Air monitoring data collected at the Uravan Site includes total suspended particulates (TSP), radionuclide particulates and radon-222. This data is collected in accordance with the site air emissions permit and radioactive materials license. Data collected during this most recent five-year review period indicates that airborne concentrations are below levels prescribed for by the State of Colorado Radioactive Materials License and air emissions permits issued for on-site remedial activities.

5.2.3 External Gamma

External penetrating gamma doses are monitored using location TLD systems that are exchanged quarterly. Annual average net gamma dose rates recorded for the nearest resident is 4 mREM per year, which is five percent of the regulatory public dose limit set forth in Part IV of the State of Colorado's radiation control regulations.

5.2.4 San Miguel River Sediment, Soil, Vegetation, and Grazing Uptake

Routine river sediment, soils, vegetation, and grazing monitoring requirements were removed from the Uravan's Radioactive Materials License in 1998. Evaluation of the previous monitoring data indicated that these media were not useful in assessing remedial efforts undertaken at the Uravan Site.

5.2.5 Tailings Pile Number 2 and Number 3; and Burbank Repository

Tailings Pile Number 2 and Number 3 are monitored for lateral movement, settlement, phreatic levels and drainage. The Burbank Repository is monitored for lateral surface movement, surface settlement and seepage. Based upon Umetco's comparison of field measurements of these geotechnical parameters and as reported to the State of Colorado Department of Public Health and Environment; there are no unexpected or discernible trends that would indicate slope instability of the tailings piles or the Burbank Repository.

5.2.6 Rim Erosion Monuments

Due to on-going site remedial activities, rim erosion monitoring activities were curtailed in 1998 with the concurrence of the State of Colorado Department of Public Health and

Environment. Rim erosion monitoring will be re-instituted as part of “long-term” surveillance of the site at the conclusion of site topographical altering remedial activities.

5.2.7 Liquid Waste Management

The Club Ranch Evaporation Ponds were constructed to manage on-site liquid waste during site remedial activities. The ponds are used to evaporate extracted groundwater; collected hillside seeps; and surface water run-off from active remedial locations. Currently, only three lined ponds remain in service; i.e. CRP-1, CRP-4 and CRP-8. Club Ranch Pond Number 4 was taken out of service in May 2005 due to damage incurred to its liner system. CRP-4 is scheduled for removal during the summer of 2005.

Run-Off Collection Monitoring: Runoff collection ponds have been monitored according to the requirements set forth in the Remedial Action Plan and in the Uravan radioactive materials license. Evaluation of analytical water quality data obtained from these ponds indicate no significant changes in storm water run-off water quality as compared with previous monitoring events. Until site remedial activities are concluded and revegetation matures, storm water run-off chemistries are not expected to change significantly.

Hill side Seepage Collection System Monitoring: Hillside seepage from Club Mesa is collected, evaluated and managed within the Club Ranch Ponds. The Remedial Action Plan requires that liquid collected from the Hillside Seepage Collection System be evaluated. Three technical points for comparison are used to determine the effectiveness of the collection system; 1) quantity and quality of collected liquids; 2) San Miguel River monitoring; and 3) ground water monitoring.

Water quality samples are collected and seepage flows are measured from the hillside monitoring stations. Evaluation of the water quality data shows some variation in chemistry of the hillside seepage. Umetco has attributed these variations to natural fluctuations in precipitation, infiltration and run-off from the Club Mesa hillside. Evaluation of hillside seepage flow rates indicate a continuing decrease, but in volumes that still require management at the Club Ranch Evaporation Ponds.

Ground water associated with the Wingate Formation is periodically monitored, sampled, analyzed and evaluated. Evaluation of Wingate Formation monitoring wells indicated no apparent impact from the hillside seepage. Ground water associated with the Kayenta Formation is periodically monitored, sampled, analyzed and evaluated. Based upon water quality data obtained from Kayenta ground water analyzed samples, water quality appears to be improving, which indicates that the hillside collection system is effective in intercepting flows to the San Miguel River.

5.2.8 Surface Water

Surface water monitoring data is collected quarterly from six sampling locations along the San Miguel River to assess potential environmental impacts. The river data include

stations upstream, downstream, and within the remedial active areas. Total Dissolved Solids (TDS) concentrations are within prescribed limits. This and other chemical data would suggest that the Uravan Site does not contribute measurable quantities of salts to the river system. During the past 15-years, contaminant flux to the San Miguel River has been reduced to levels that have no measurable impact on the river system.

5.2.9 Ground Water

Ground water at the Uravan Site has been monitored since 1987 in accordance with the Remedial Action Plan. Monitoring activities include wells on Club Mesa and within the San Miguel River Valley. Since 2003, ground water monitoring has been limited to the Points of Compliance Wells in accordance with approvals given by the State of Colorado Department of Public Health and Environment. Except for shallow perched liquids, ground water pumping and management at the Club Ranch Ponds has been terminated. Current operations at the Uravan Site appear to not impact ground water.

5.3 Occupational Health and Safety

Umetco has established a documented occupational health and safety program at the Uravan Site, which includes training; work-place surveillance; program administration and; quality control/quality assurance review/oversight. Radiological worker protection programs at the Uravan site meet the requirements of the Colorado Rules and Regulations Pertaining to Radiation Control as administered by the Colorado Department of Public Health and Environment. Uravan health and safety policies and procedures conform to the standards promulgated by the Occupational Safety and Health Administration (OSHA). Umetco has implemented a self-audit program that routinely evaluates the effectiveness of the radiological, health and safety programs at the Uravan Site using internal QA/QC audit procedures and periodically by independent non-Umetco discipline specific experienced professionals.

5.3.1 Radiological Exposure

Employees of the Uravan Site Operations are exposed to radon progeny, alpha, beta and gamma radiation, airborne dusts containing natural uranium, thorium-230, radium-226, and other decay products from the uranium decay chain. The State of Colorado, Radiation Management Program; regulates occupational exposure levels within the work place and where the public may be exposed. Umetco implements and completes annual performance audits, which evaluates the level of radiological occupational exposure at the Uravan Site. These annual performance audits have indicated that radiological exposure levels for the Uravan operating period of 1991 to 2001 have been maintained As Low As Reasonably Achievable (ALARA).

Since 2001 occupational exposure monitoring has not been required for site employees, in that routine monitoring has indicated that radiological exposures have been met radiological protection standards established for the Uravan Site. Specifically, the

potential for radiological exposure for workers at the Uravan Site are less than ten-percent (10%) of the applicable radiological exposure standard established for the site.

The radiological dose to the nearest resident potentially affected by Uravan Site operations was 4-mrem, well below exposure standards set for the public.

5.3.2 Worker Occupational Safety and Health

Uravan Site safety and health surveillance programs provide monitoring and management of potential worker workplace exposures to noise and harmful materials. Remedial activities at the site generate silica dust from the use of heavy earth moving equipment in predominantly sandstone-bearing areas. Uravan manages the potential exposure for silica dust by implementing dust mitigation operations and by providing worker protection where necessary. Occupational exposure monitoring for silica dust indicates that exposure levels are below that prescribed for by OSHA.

Site surveillance programs for worker safety and health for potential heavy metal exposure in the remediation area have indicated that airborne concentrations are presently being maintained below applicable OSHA standards.

Exposure to elevated noise levels in the Uravan operation areas is anticipated and observed. Elevated noise exposure is due to the use of heavy earth moving and construction equipment. As such, hearing protection is mandated for personnel working in and or around remediation activities where noise levels exceed the OSHA Action Level of 85dBA.

5.4 Quality Assurance and/or Quality Control (QA/QC)

UMETCO has implemented RAP Quality Assurance and a Quality Control Program (QA/QC) for the purpose of observing, testing and documenting Uravan Site Remedial Activities. The QA/QC control of site activities and remediation is accomplished by:

1. Generation of design, operation history and completion reports for each phase of the Uravan Site remediation;
2. Internal and external performance audits against documented permit, license, and RAP remediation criteria, and;
3. Umetco funding of a State of Colorado on-site coordinator to review remediation performance against documented permit, license and RAP remediation criterion.

Umetco generates quarterly reports, which have been filed with the State of Colorado. These quarterly reports detail the status of ongoing remediation efforts at the Uravan site and the scheduling of future remediation efforts. As each remedial phase is completed, Completion Reports are filed with, reviewed and approved by the State of Colorado on-site coordinator. Annual reports are generated, which detail occupational and environmental monitoring and/or surveillance observation data during the remediation

efforts and include QA/QC documentation. Additional QA/QC data is contained in the project files, which include geotechnical testing related to the site remediation.

5.5 Community Relations

Umetco Minerals Corporation is actively involved with local communities of Naturitia and Nucla. These activities include preservation of the historic structures of Uravan, the development of a public recreation area outside the CERCLA Site Boundary, and decontamination of an office building for future utilization by local communities.

In 1999, Umetco completed restoration work on property owned by the Nature Conservancy. This work included removing radioactive materials and revegetating the disturbed areas. Restoration activities included constructing a rest stop for public viewing and for people visiting the Nature Conservancy property.

5.5.1 Rimrocker Historical Society

Since the completion of the restoration of the Uravan historical structures in 2000 and the completion of radiological risk assessments in 2004, Umetco and the Rimrock Historical Society are in the process of transferring ownership of the historical structures and associated property to the Rimrock Historical Society for future use and preservation care. The Rimrocker Historical Society is seeking a 2005 funding grant for exterior renovation of the Community Center Building. A land/structure ownership transfer of the historical properties is being negotiated with Montrose County, Colorado. The ownership transfer will include the placement of institutional controls on the property. As part of the transfer due-diligence, an active radon mitigation system was installed in the Community Center Building during the third quarter of 2004 and minor cleanup activities were conducted in the non-Remedial Action Plan areas within the transfer boundary during the fourth quarter of 2004. The minor general cleanup activities included areas southeast of the Community Center and Boarding House Buildings, including the former Gym area and E-Block area.

5.5.2 Community Relations Interviews

Uravan Five-Year Review Community Relations

As part of the Five-Year Review process; U.S. EPA, Region 8 interviewed four Uravan area stakeholders on June 1 and 2, 2005.

All of the persons interviewed expressed satisfaction with the remedial actions to date. The work is well done and the cleanup is a benefit to the areas communities.

Those interviewed believe that future cleanup work will be satisfactory with some concerns. Because of a large amount of spring moisture, the pond work is behind schedule. Equipment is being moved to the site to begin the pond work. There are no

doubts that the work will be completed. Umetco has been responsible and responsive. As an example, Umetco promptly addressed a recent tear in a pond liner.

The transfer of the property to Montrose County for lease to the Rimrockers Historical Society has been a slow process. The transfer will occur after the cleanup is completed. Some buildings will likely need renovation. The Rimrockers will establish a historical museum about uranium mining in the area.

There is some concern about waste left under the highway. The Colorado Department of Transportation is working on the issue. There also is concern about what will happen with the abandoned bridge on the west end of the site.

Those interviewed said that people in the area are generally satisfied with the work. These Uravan area stakeholders and residents believe that the remedy is protective of human health and the environment. The comments of the persons interviewed included the following:

5.5.2.1 Citizen

Citizen comments were:

- The remedy has been positive. Completed work has been done well.
- Starting on ponds. Some concern about the ponds: How they will be cleaned up and when. Behind on work because of spring moisture. Believes the work will get done ok.
- Less satisfaction on transfer of property to historical society (Rimrockers). Has been slow process.
- Paradox area. County will put restrictions on road but not close it. Umetco will need to provide a map and information to help process.
- Need for water assessment and reclamation after site completion.
- Concerned about supplemental standards for highway – waste under highway. CDOT is working on this – it will get done. Concerned about the abandoned bridge on west end. What's going to happen with the bridge?

5.5.2.2 Local Government

Local Government comments were:

- Good cleanup to this point. Believe that good work will continue. Have the ponds left to clean up.
- Historical society waiting for cleanup to be complete so UMETCO can turn the property over to Montrose County, which will lease it to the Rimrockers. Some buildings will likely need some renovation.
- People in area generally satisfied with work. Mayor not sure it all needed to be done but it's a good cleanup.

5.5.2.3 State Government

State Government comments were:

- Remedy is protective of human health and the environment.
- Local stakeholders are satisfied.
- Mr. Stoffey maintains contact with locals and hears concerns and opinions.
- Some concern about leaving waste under the highway and the abandoned bridge. Umetco has been very responsible.
- Recent finding of tear in pond liner resulted in Umetco promptly addressing the problem.
- Umetco is mobilizing summer 2005 construction equipment on site the week of May 30, 2005 and starting with the Club Ranch Evaporative Ponds cleanup.

5.5.2.4 Umetco Minerals Corporation

Umetco Minerals Corporation comments were:

- Commented that this has been so far an 18 year project.
- There have been three or four public hearings by the State.
- Has never heard public comment that the cleanup has been done the wrong way.
- There were concerns from some (the Western Colorado Congress) about importing waste (such as Shattuck) to the site.
- Umetco has kept in close contact with locals over the years. Mr. Junge mentioned the names of some of those local persons as; Leo Large, Mary Helen DeKoebe, Cameron Riley and his predecessor plus others such as the county attorney, other commissioners.
- There may have been a few locals who feel they got a raw deal but most feel that they got a good deal from the cleanup.
- Umetco is trying to get the Uravan historical buildings property transferred so the Rimrockers can set up a historical museum about the uranium mining in the area.
- Noted that the local historical society had gotten a grant from the state historical society but could not work on site because of hazard waste training requirements. Umetco did the work for the local historical society even though the cost exceeded the grant.

5.6 Compliance

The Uravan Remedial Action Project is in substantial compliance with the Consent Decree and the Applicable or Relevant and Appropriate requirements as documented in the Record of Decision for the Uravan Site. All remedial action deadlines as specified by the RAP, as modified, and as required to date have been met. The remedial activities conducted at the Uravan Site, thus far, have reduced the release of contaminants from site source areas by the construction of engineered remedial control features and; as such, the remedy selections continue to be protective of human health and the environment.

6.0 RECOMMENDATIONS

The review of the remedial activities and monitoring data indicate that changes to the selected remedies as outlined by the Remedial Action Plan are not needed. It is recommended that the Remedial Action Plan continue to be implemented in accordance with the approved plans, specifications and project procedures.

During the May 11, 2005 Site Visit and subsequent evaluation of remedial activities at the Uravan Superfund Site, the following recommendations are suggested for review and implemented where and when appropriate:

1. Provide a definitive time-line schedule for the implementation and completion of RAP construction/closure activities, reports i.e.:
 - Club Ranch Ponds.
 - Club Mesa Tailings Piles.
 - B-Plant Area Repository.
 - Mill Hillside and Mill Areas.
 - Hillside Seepage Management.
 - Surface water run-off control features.
 - Ground water monitoring.

Umetco has presented its schedule to complete remedial activities at the Uravan Superfund Site for the above listed areas. To ensure conformance with the Remedial Action Plan, a discussion of the balance of the work plan and their objectives needs to be presented to the regulatory community as a source of information for public disclosure.

2. Provide a continued systematic management program of collected site liquids from hillside seepage collection system(s) and storm water runoff from active repository units.

Site visit observations indicated the presence of liquids that are still collected by the Toe Berm and Hillside Seepage collections systems. Collected liquids have not been characterized as hill side seepage, rain water or snowmelt. As part of the continued evaluation of the Remedial Action Plan Objectives and the methods by which to meet those objectives, an assessment and an evaluation of how future post-remediation Hillside and Toe Berm seepage collection methods and collected liquids management will be implemented needs to be completed, reviewed and approved by the regulatory agencies, and implemented.

3. Provide an updated maintenance and repair program of constructed storm water management systems.

Site visit observations indicate the need to inspect and repair erosion features created by storm water run-off from the Club Mesa Areas and Club Mesa Repositories. This would include those areas that are now part of site drainage patterns because of

changes in topography by the construction of waste repositories. Storm water channel construction has modified surface water flows and directed drainage to existing drainage ways and created the erosion feature noted on the north face of the Club Mesa Tailings Piles 1 & 2 and The Club Mesa Spray Area Repository.

4. Continue to provide inspection, repair and maintenance of in-service Club Ranch Ponds; and implementing a systematic closure of the Club Ranch Ponds that are deemed non-serviceable and/or are no longer required as liquid management systems supporting other on site RAP activities.

The May 11, 2005 site visit inspection initially identified six liner failures in Club Ranch Lined Evaporation Pond CRP #4. A detailed visual inspection conducted by Umetco Minerals Corporation was performed on May 12, 2005, which identified two additional liner failures for CRP #4 and three liner failures for Club Ranch Lined Evaporation Pond CRP #8. Club Ranch Lined Evaporation Pond CRP #4 was taken out of service; drained of its contents and is scheduled for removal/remediation during the summer of 2005. However, CRP #8 has not been schedule for repair. The use of lined evaporative ponds is to be conducted in a manner that presents them suitable for service. While the liner failures were noted on the crest of the pond berm; inspection of the leak detection sump does not indicate excessive collected liquid volume generation; and does not necessarily present a potential for release of its contents to the environment. CRP #8 should be maintained in a physical condition consistent with the requirements of the Remedial Action Plan. CRP # 8 should be fully inspected and repaired as required to maintain liquid containment. CRP #1 Pond has been removed from service.

5. Develop a “Windblown Area” assessment and evaluation investigation using as a minimum “area-averaging methods” as prescribed by the Colorado Department of Heath – Radiation Management Program Guidance. When the Windblown Area has been assessed, draft a report summarizing observed observations, assessing the risk to public health and the environment, and mitigation recommendations, if any.
6. Verify the proper disposition and action on disposal of PCB containers stored within the RAP boundaries and have the PCB containing materials managed in a manner consistent with environmental regulations governing the recordkeeping, storage, handling and disposal of PCB containing materials.
7. Resolve issues with the Colorado Department of Transportation for the management and remediation of radioactive waste materials remaining beneath Colorado Highway 141 and implementing response in concurrence with the RAP.
8. Finalize Institutional Control Agreement and its implementation by Montrose County Board of County Commissioners for Montrose County Roads Y-11 and EE-22.

**US EPA, REGION 8: MAY 2005
FIVE YEAR REVIEW RECOMMENDATIONS
FOR
UMETCO MINERALS CORPORATION URAVAN SUPERFUND SITE**

| Item Number: | Issue : | Recommendation: | Due Date: | Responsible Party: |
|--------------|---|---|-------------------|---|
| 1 | Existing time-line schedule for implementation and completion of RAP activities is not current. | Issue completion schedule acceptable to regulatory agencies consistent with RAP requirements. | December 31, 2005 | Umetco Minerals Corporation and CDPHE |
| 2 | Presence of liquids in hillside collection sumps . | Make an engineered/technical assessment of the performance of closed/capped hillside collection system. | November 30, 2005 | Umetco Minerals Corporation |
| 3 | Portion of existing Club Mesa storm water management features show excessive erosion . | Provide systematic Inspection and O&M Plan for constructed and existing storm water management system component features. | November 30, 2005 | Umetco Minerals Corporation |
| 4 | In-service Club Ranch Ponds have numerous liner failures. | Provide updated and revised inspection plan requiring the timely repair and/or decommissioning of subject evaporative CR Ponds. | October 31, 2005 | Umetco Minerals Corporation |
| 5 | Inspection, sampling of the wind blown areas north and south Uravan Site indicate the presence of airborne dispersed radioactive materials. | Provide for a wind-blown area-averaging assessment plan and implementation schedule which evaluates public health and environmental risk. | December 31, 2005 | Umetco Minerals Corporation and CDPHE |
| 6 | Timely management of stored PCB's. | Verify proper transport, management and disposal of PCB's | October 31, 2005 | Umetco Minerals Corporation |
| 7 | Radioactive materials beneath Colorado Highway 141 | Coordinate with the State of Colorado Department of Transportation for the timely removal and mitigation of Colorado Highway 141 radioactive materials, which is consistent with the Remedial Action Plan | December 31, 2005 | Colorado Department of Transportation, CDPHE and Umetco Minerals Corporation. |
| 8 | Land use management of Montrose County Roads Y-11 and E-22 is not consistent with the requirements of the RAP and Consent Decree. | Provide formalized institutional control document with Montrose County which will ensure for the timely and proper land use control for future use, repair and maintenance of County Roads Y-11 and E-22. | December 31, 2005 | US-EPA(8), CDPHE, Montrose County and Umetco Minerals Corporation |